Products Finishing

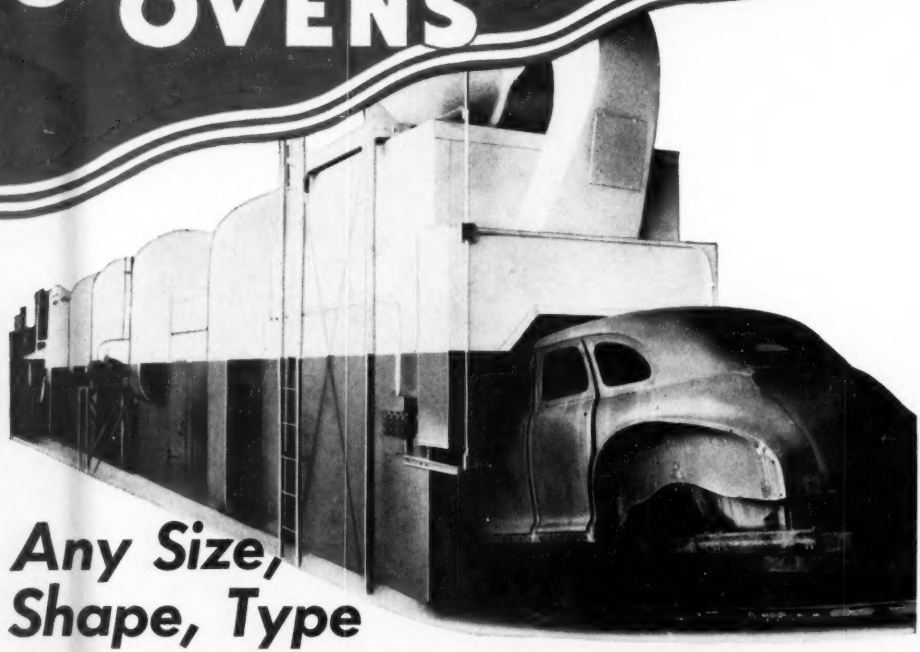
CLEANING
PLATING
POLISHING
FINISHING

FEBRUARY 1951

Engineered to your production

Schmieg OVENS

CENTRI MERGE



Any Size, Shape, Type
FOR EVERY KIND OF WORK

Whatever your requirements, Schmieg drying and baking ovens are designed and engineered to give you highest efficiency at lowest operating and maintenance cost.

Conveyor or box type, for any installation arrangement, compactly designed to save valuable floor space, engineered to fit smoothly into your production plan, Schmieg ovens *make it easy* for you to turn out the very best paint jobs.

Schmieg ovens give you automatic temperature control, insure against hot spots, are meticulously insulated to prevent heat loss. Every operating essential has been carefully designed and engineered to enable you to safeguard product quality.

So we say—No matter what size, shape or type of oven you may need, for any kind of work, Schmieg ovens give you most for your money.

Consult Schmieg engineers today.

THE *best* AIR PURGE *is* CENTRI MERGE

Schmieg INDUSTRIES INC.

Engineers & Manufacturers

314 PIQUETTE AVENUE • DETROIT 2, MICHIGAN

All at one time . . .
it removes rust,
removes oil,
prepares the metal
for painting

This FREE Folder Tells About Oakite's Great New Pre-Paint Cleaner

OAKITE Compound No. 33 is a cleaning-phosphating material that simultaneously removes oil and rust and conditions the metal surface for painting.

It also removes heat scale and other oxides, carbon smut, soldering and welding residues, identification inks and other soils from steel, cast iron, aluminum sheet and castings.

Oakite Compound No. 33 is a great soak cleaner for metal parts of moderate size; and great for hand-swabbing on large pieces like cabinets, desks, doors and truck cabs.

Oakite Compound No. 33 saves money; *frequently eliminates pickling operations on moderately rusty steel.*

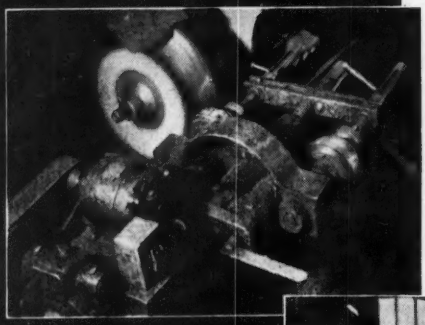
FREE Write to Oakite Products, Inc., 20 Thames St., New York 6, N. Y., for your copy of Folder F7993 on *"Oakite Compound No. 33".*

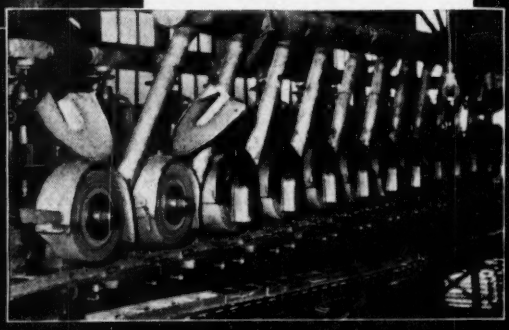
Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE
TRADE MARK REG. U. S. PAT. OFF.

SPECIALIZED INDUSTRIAL CLEANING
MATERIALS • METHODS • SERVICE

Better Results for *LESS*...
on *EVERY* Polishing Job





with ALUNDUM Polishing Abrasive

YES, for better results on offhand, semi-automatic and automatic polishing operations, specify cost-cutting ALUNDUM Polishing Abrasive.

- For fast cut on roughing operations—where cement is the adhesive — specify S-treated ALUNDUM Abrasive.
- For a general purpose abrasive for roughing or finishing —where long life is of primary importance — and where the wheel is set up with cement or glue—specify B-treated ALUNDUM Abrasive.
- For finishing operations, where glue is the adhesive, specify R-treated ALUNDUM Abrasive.

NORTON COMPANY
Worcester 6, Mass.
Distributors In All Principal Cities

NORTON
ABRASIVES

G-222

Single Responsibility

... by concentrating your orders with a single source of supply, you eliminate many hours of costly paper work. You pay one bill ... have only one supplier who is responsible for your satisfaction ... you get your order when and how you want it ... eliminate days and maybe weeks of waiting. Whether you want an automatic conveyor or a pair of rubber gloves, H-VW-M can shoulder the whole responsibility for the entire order.

Service

... H-VW-M technical assistance is provided by a highly trained staff of chemical, electrical and mechanical engineers backed by the finest laboratory facilities in the industry. H-VW-M Service does not end with delivery of your order ... it is always on tap anytime and anywhere. H-VW-M products are strategically warehoused for prompt delivery ... and because inventories are large all orders get immediate attention.

Dependability

... it's your right to expect and get full dependability from your supplier. Only then can you operate with maximum efficiency and economy ... be sure your product has the extra salability that comes from consistent uniformity and quality of manufacture. Pioneer in developing equipment and supplies for the plating and polishing industry, H-VW-M has honestly earned a highly regarded reputation for complete dependability under all circumstances.

Fair Prices

... you have a right to expect to get exactly what you pay for ... to receive equipment and supplies that accurately measure up to specifications and represent full value of your investment. H-VW-M equipment and supplies are priced to meet changing market conditions ... and H-VW-M *always* delivers full value. What's equally important, is the fact that because H-VW-M serves as the central source of supply for ALL the needs of the electroplating and polishing industry, you can always be sure that price levels will be equably maintained.

Uniform Quality

... means that you get full value for your investment. It means that you are doing a better job ... are helping your company operate at higher profit levels. The reputation for uniformly high quality H-VW-M has earned is one that has been built up honestly over many years. It is your right to expect it. Through strict control of every manufacturing process H-VW-M works ceaselessly to see that you get uniform quality.

HANSON-VAN WINKLE-MUNNING COMPANY, Matawan, N. J.
Plants at: Matawan, N. J. • Anderson, Indiana • *Sales Offices:* Anderson Chicago • Cleveland • Dayton • Detroit • Grand Rapids • Matawan Milwaukee • New Haven • New York • Philadelphia • Pittsburgh Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica

SINCE 1920

H-VW-M

Manufacturers of a complete line of electroplating and polishing equipment and supplies.

We're CLOCKWATCHERS

...and proud of it!

And it's a good thing we are, for as conditions change, specification finishes demands change too. Here at Egyptian our laboratory staff have been working round the clock to bring our government specification formulas up to date. Now in this emergency we are ready to serve you; to provide you, with no delay, the maximum in finish performance—better because it is Egyptian.

SYNTHETICS • VARNISHES • LACQUERS • ENAMELS

THE EGYPTIAN LACQUER MFG. CO.,
Box 444, Newark 1, N. J.

Please forward further information on Egyptian specification finishes.

MR. .....

FIRM .....

ADDRESS .....

.....

South Kearny, N. J.

EGYPTIAN
INDUSTRIAL FINISHES

Lafayette, Ind.

EZRA A. BLOUNT, *Editor*

Products finishing

FEBRUARY 1951

VOLUME 15 • NUMBER 5

CONTENTS

Help for the Job Plater 13
Editorial

Abrasive Grain Sizes Re-endorsed by Industry . 14
By Henry R. Power

Finishing Clinic 18

Polishing and Plating at Repcal Brass Manufacturing Company 22
By George M. Kent

Copper Stripping Non-Dangerously 26
By Wilfred S. McKeon

New Finishing System Promises High Erosion Resistance 30
By Gilbert C. Close

Spotlighting Finishing Progress
By Dr. Allen G. Gray

—**Evaporation Rates of Solvents and Thinners in Organic Finishes** 38

—**Bright Nickel Has Advantages As An Undercoat for Brass and Gold** 60

—**Black Finish With Light Absorbing Characteristics for Magnesium** 66

—**Mechanism of Formation of Electroplated Brass** 72

Practical Applications of Modern Products

—**Methods and Equipment for Steam Spraying of Lacquer and Synthetic Finishes** 76

—**New Brushing Method Produces Attractive Surface Finish on Golf Club Shafts** 77

—**Tin Recovery with Hydrogen Peroxide** .. 78

News of the Industry 80

Finishes That Aid in Appearance and Utility ... 98

New Equipment, Materials, Processes 100

Opportunity Section 125

The Finishing Touch 126

Index to Advertisements 127

A New Service to Readers 128

ROBERT I. SHORE
Associate Editor

H. LEROY BEAVER
ALLEN G. GRAY
BRYANT W. POCOCK
Consulting and Contributing Editors

GENE J. SCHWARBER
Advertising Manager

NORMAN S. ROGERS
Art Director

A. J. WALKER
Circulation Manager

ADVERTISING REPRESENTATIVES

RICHARD S. KLINE
GEORGE E. HAY
431 Main St., Cincinnati 2
MAin 0182

G. M. FILLMORE
342 Madison Ave., New York 7
Murray Hill 7-7390

CHARLES H. DEILY, JR.
351 Mattison Ave., Ambler, Pa.
Ambler 0339

JOHN M. KRINGS
Tribune Tower, Chicago 11
DElaware 7-5441

THE ROBERT W. WALKER CO.
684 S. LaFayette Park Place
Los Angeles 5
DUnkirk 7-4388
69 Post Street, San Francisco 4
SUtter 1-5568

MEMBER

ECA

NBP

Published monthly and copyrighted (1951) by

GARDNER PUBLICATIONS, INC.
431 Main Street, Cincinnati 2, Ohio
Printed in U.S.A.

ONE MAN OPERATION with BLAKESLEE METAL PARTS WASHERS

BLAKESLEE SOLVENT VAPOR DEGREASERS
—economical, efficient—
USE LESS SOLVENT

BLACOSOLV
Stabilized Degreasing Solvent — one price, one solvent *for all metals*

Blakeslee's new washer saves labor, is economical

Just one man can keep the production line going with this time saving metal parts washer. Turn table operation permits loading and unloading in one easy pivot movement. One revolution of the washer turn table and parts come out sparkling clean for a better finishing job with fewer rejects. Blakeslee washers are designed for every type and size of plant operation. Write for the cooperative services of our engineer-trained sales representatives.

G. S. BLAKESLEE & CO.

1844 S. 52nd Avenue • Chicago 50, Illinois

New York, N. Y. Toronto, Ont.

Aloxite TPC

For a variety of metal finishing operations where it's not practical to stock several types of grain and make time-consuming wheel changes, you'll get best results with ALOXITE TPC aluminum oxide grain by CARBORUNDUM. Medium sharp and tough, ALOXITE TPC grain provides maximum adhesion when used with cold cement. It is well suited to polishing operations in which a small amount of metal is to be removed. Accurately graded to provide solid, well-shaped grains of uniform size; free from "flats" and "slivers" (the weak grains that do no work). For increased production efficiency and economy in *your* metal finishing—use general purpose ALOXITE TPC aluminum oxide grain by CARBORUNDUM. Write for special booklet on metal polishing with grain.

Only CARBORUNDUM

TRADE MARK

makes ALL abrasive products . . . to give you the proper ONE

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, New York

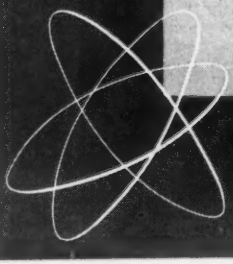
Palladium

PLATING SOLUTION

FOR ELECTRONIC APPLICATIONS

Ours is a self-sustaining solution, working from anodes. Gives excellent results in plating connectors, wave-guides and other electronic equipment where specified.

We make the anodes, too.



Baker & Co., Inc.

113 ASTOR ST., NEWARK 5, N. J.

New York • San Francisco • Chicago

Now!

Prep-pik-I

(Phosphoric Acid Pickling Process)

used in conjunction with Permutit Q Process is . . .

Competitive, COST-WISE
Superior, PAINT-WISE
OVER SULPHURIC ACID PICKLING

Consider these Advantages:

- Simultaneous Pickling and Phosphatizing in one bath!
- No Plant Corrosion troubles!
- Less Floor Space!
- Continuous Regeneration!
- Applicable to Defense Contract Work!

NOTE: FOR COMPLETE INFORMATION ON THIS PROCESS SEND FOR BULLETIN FORM 51-3

NEILSON CHEMICAL COMPANY

2682 Tecumseh Rd. Windsor, Ont.

6561 BENSON ST., DETROIT 7, MICH.

3411 Union Pacific Ave. Los Angeles 23, Calif.

How to Determine Impurities

Of all methods for determining minute impurities in plating baths, the most practical is the *colorimetric.* The principle utilized is simple: color intensity, due to presence of a colored constituent, is directly proportional to the concentration of that constituent.

USE OF THE COLORIMETRIC METHOD

This method requires the measuring of light transmitted by solutions.

Intensity of the transmitted light is measured by photo-electric means to attain a high degree of accuracy. No two solutions of different character will have transmittancy curves of exactly the same shape, hence, a solution under test is usually compared to a reference solution free of impurities. Calibration curves plotted from a series of runs facilitate determinations. Summaries of techniques used to determine four different impurities follow:

LEAD IN NICKEL PLATING BATHS

Lead is separated from interfering ions by extraction with a carbon tetrachloride solution of dithizone in the presence of potassium cyanide. After removal of the excess dithizone with alkaline potassium cyanide, the transmittancy of the solution is measured and the quantity of lead present determined from a calibration curve.

IRON IN NICKEL PLATING BATHS

Iron is separated from the other metallic ions by precipitation with cupferron. The iron cupferride is extracted with amyl acetate and then returned to the aqueous solution by shaking the amyl acetate extract with nitric acid. The iron is then reduced with hydroxylamine hydrochloride. O-phenanthroline is added, and the pH is adjusted with sodium acetate. Finally, the light transmission of the ferrous o-phenanthroline complex is measured.

MANGANESE IN NICKEL PLATING BATHS

The manganese is oxidized to permanganate by sodium periodate in an acid mixture of phosphoric and

in Electroplating Solutions

perchloric acids. The transmission of the solution is then measured.

COPPER IN NICKEL PLATING BATHS

Copper is isolated from the other constituents in the plating bath by precipitation with 2-mercaptobenzothiazole and extraction of the precipitate with amyl acetate. The color is then developed by addition of dibutyl amine and carbon disulfide. After the solution has been diluted with ethyl alcohol, its transmittancy is measured.

A.E.S. RESEARCH PROGRAM

The American Electroplaters' Society is conducting a comprehensive research program and has developed useful information on current plating problems. International Nickel, in addition to its other support of this program, feels that it will be a further service to make copies of these A.E.S. Research Reports available.

For an authoritative, detailed, 48-page study of this subject, we offer you a free copy of the A.E.S. Research Report, Serial No. 3, entitled *"Determination of Impurities in Electroplating Solutions."* Write us for your copy, now.

Because of unusually heavy industrial and defense demand, rationing of nickel has been in force since July 1st. On January 1, 1951, National Production Authority Order M-14, respecting the consumption of primary nickel, went into effect.

We shall continue to issue information on new developments and user experience with nickel-containing materials as we believe that dissemination of such data can help to promote the intelligent utilization of critical materials, so essential in these times.

EMBLEM OF INCO SERVICE
TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

A COMBINATION THAT IS HARD TO BEAT

Cowles

KW and SK

All subsequent cleaning operations are reduced to a minimum by using K W alkaline cleaner and S K emulsion type cleaner together in the pre-soak operation. These two fast acting, efficient and economical cleaners do a real job of removing oils and stubborn soil when used in combination.

K W Cleaner alone will handle all cleaning operations after the soak cleaning. It can be used in still tanks—with or without electric current.

COWLES TECHNICAL SERVICE ON REQUEST

PROMPT SHIPMENTS FROM LOCAL STOCKS

COWLES CHEMICAL COMPANY

Pf editorial

Vol. 15, No. 5

FEBRUARY, 1951

Help for the Job Plater

The average Job Plater's position in the electroplating industry is never too secure, since he is continually faced with the problems of price competition, continual revision in his shop processes to accommodate customers' new products, and the usual management problems common to any business. The Job Plater has, in the past, rendered a distinct service to American productive effort by taking up the slack between consumer demand and the capacity of "captive" plating departments, as well as by finishing plated components for manufacturers having no plating facilities.

Now, to add to the normal problems of the Job Plater, come the Government Regulations, limiting and restricting the use of many metals normally plated. The Job Plater must now get Defense Orders, which in most cases require a partial conversion of his facilities; or, he must change his methods to use the products and processes still available for civilian production; otherwise, the Job Plater cannot survive.

The National Association of Metal Finishers, through its several local or area sections, stands ready to help the Job Plater with his problems. The Association can assist by providing information on standard shop practice, government regulations, industry news of particular interest to the Job Plater, and can serve as spokesman for the Job Plater.

However, such an arrangement cannot be treated as a "one way street"; each Job Plater must offer his cooperation and support to the NAMF, so that the work of that body may become increasingly effective.

Ezra A. Blount

Abrasive Grain Sizes Re-endorsed by Industry

By HENRY R. POWER
The Carborundum Company
Niagara Falls, New York

TWENTY years ago, the Abrasive Grain Manufacturers were one of the first groups to assist in the then new project of simplication to eliminate Waste in American Industry. The goals then sought by Mr. Hoover and the Department of Commerce in all industry were economy in production, efficient functioning and effective interchangeability.

A twenty-year experience with standardization in the Abrasive Grain Industry confirms the wisdom of this course. The polisher who prefers more than one source of supply for the abrasive grains used in his shop can be assured that the "size characteristic" will be the same in the modern abrasives, silicon carbide and electrically fused alumina available from a variety of sources. The importance of duplication of size dimensions cannot be overestimated. Oversize particles in the grit he selects definitely scratch the surface; that is, they produce occasional surface irregularities on the metal that are wider and deeper or both, than the average effect desired in the particular operation. These scratches may not be visible until the product is submitted to other operations like plating, lacquering, and so on, thus incurring expense and rejection of product at the final inspection. Too many undersize particles, on the other hand, slow up the cutting action of the abrasive and so affect the economy of the polishing shop.

Continued research in the past twenty years on polished metals reveals a polish layer of remarkable properties, one of which is its vitreous or glassy nature. The development of this polish layer by polishing and buffing is the function of the polishing shop. The advantages of the polish layer are its continuity, the absence of pits and cavities which reduce corrosion; also, an increase of hardness at the surface. While this polish layer, or vitreous skin, is only a few hundred-thousandths of a millimeter thick, the metal layer below this is disturbed to a much greater depth below which, again, is the original undisturbed material. The earlier stages of polishing are, therefore, important since they prepare the surface for buffing which develops the polish layer. Buffing operations can be simplified by care in polishing. The polisher, therefore, is concerned with the careful selection of abrasives for use in the earlier stages, and one property he wants, among others, is uniformity of size from one shipment to another because this, in part, controls the size, shape and distribution of surface irregularities on the metal which is applied to the polishing wheel coated with the selected abrasives.

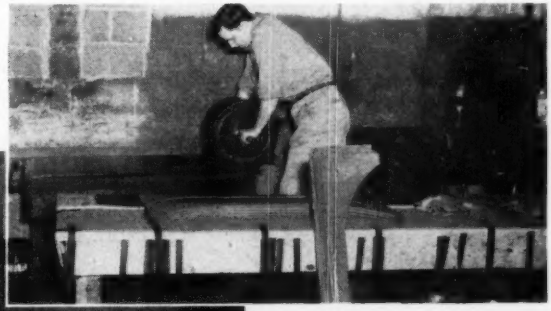
In adopting the standardization on sizes of abrasive grains there was no limitation on the improvement of the abrasives in other respects. For instance, the improvement of the granule

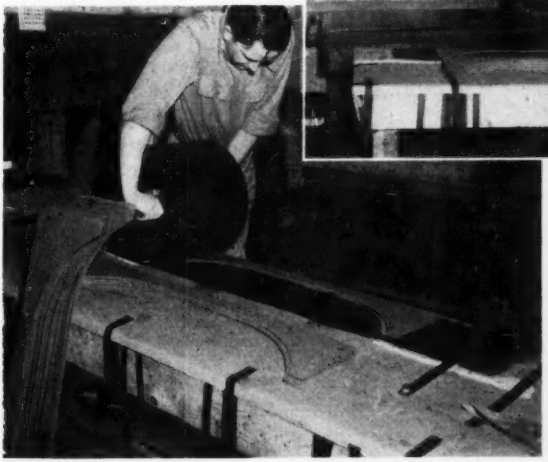
surface or surface tenacity characteristic in order that the glue adhesive might anchor more firmly and thus prevent shedding of abrasive from the polishing wheel in use, was a distinct improvement in lengthening the life of the polishing wheel.

The Department of Commerce has now issued Simplified Practice Recommendation 118-50, "Abrasive Grain Sizes", which differs from earlier issues because the standards of abrasive grains used in polishing have been separated from those sizes used in grinding wheels. The reason given for this separation is stated in the bulletin as follows:

"Separate tables are required because the standards differ. The polishing grain standards are more critical than is required for abrasives used to make grinding wheels. In the latter application many wheels are mixtures of two or more sizes; hence, the sizing of each need not be too critical. Conversely, any broader standards that suffice for grains entering wheels are not sufficiently critical for use in polishing operations where the job is almost invariably done with a single grit size. Also, the type of abrasive grit, its shape, and treatment often differ for polishing use from the quality required for wheel use; hence they are not interchangeable."

GRAINING ROOM FOR TRIM PANELS





The accompanying illustrations show the essential operations used in applying the wood grain design to metal interior trim panels in the plant of Crosley Motors, Inc., Marion, Indiana. Inside trim panels for car doors are first sprayed with an undercoat and baked. In the upper photograph the operator is picking up the grain design from the graining table on the rubber coating of a rolling cylinder. The next step of the operation illustrated in the photograph below is the direct transfer of the grain design from the rubber coating of the rolling cylinder to the trim panels. The operator applies the design by rolling the cylinder smoothly over each panel. The grained panels are subsequently baked. Using this method an operator can produce approximately 130 pairs of inside trim panels per day.

ALLOWABLE LIMITS FOR THE SIZING OF ALUMINUM-OXIDE AND SILICON-CARBIDE ABRASIVES FOR POLISHING USES

Grit No.	Sieve through which 100% must pass	Control sieve		Maximum of oversize on control sieve	Minimum through control sieve and retained		Cumulative minimum through control sieve and retained		Maximum of 3% through sieve No.
		No.	Opening		Per cent	On sieve No.	Per cent	On sieve No.	
			Inches	*Per cent*					
8	6	7	0.111	15	45	8	80	8 & 10	12
10	7	8	.0937	15	45	10	80	10 & 12	14
12	8	10	.0787	15	45	12	80	12 & 14	16
14	10	12	.0661	15	45	14	80	14 & 16	18
16	12	14	.0555	15	45	16	80	16 & 18	20
20	14	16	.0469	15	45	18	80	18 & 20	25
24	16	20	.0331	20	45	25	75	25 & 30	35
30	18	25	.0280	20	45	30	75	30 & 35	40
36	20	30	.0232	20	45	35	75	35 & 40	45
46	30	40	.0165	30	45	45	65	45 & 50	60
54	35	45	.0138	20	45	50	75		70
60	40	50	.0117	30	45	60	65	60 & 70	80
70	45	60	.0098	15	45	70	70	70 & 80	100
80	50	70	.0083	15	40	80	70	80 & 100	120
90	60	80	.0070	15	40	100	70	100 & 120	140
100	70	100	.0059	15	40	120	65	120 & 140	200
120	80	120	.0049	15	30	140	60	140 & 170	230
150	100	140	.0041	15	40	170 & 200	75	170, 200, & 230	270
180	120	170	.0035	15	40	200 & 230	65	200, 230, & 270	—
220	140	200	.0029	15	40	230 & 270	60	230, 270, & 325	—
240	170	200	.0029	5	8	230 & 270	38	230, 270, & 325	—

—From Simplified Recommendation 118-50

It is clear from the foregoing that the more critical character of polishing grains has now been recognized. Standards, which are limits set on specified U. S. standard sieves, after sifting a 100 gram sample for 5 minutes on a Rotap Machine at a speed of 290 r.p.m. and 150 taps per minute are as shown in the table.

Corrosive action of acids, alkalies and other chemicals on railroad hopper cars and similar equipment is forestalled up to six times as long by a new finish based on Vinylite resins. Test cars painted with this material carried punishing cargoes such as cement and soda ash more than three years (top photo). They remained almost completely free of corrosion—even where sledge hammers had been used to break cargo loose (bottom photo). In addition to providing long-life resistance to corrosive effects of acids, soda ash, sulfur, alkalies, phosphate, common salt, and cement, the new finish withstands repeated scrubbing and washing with strong cleaning solutions. It has excellent weather durability as well as unusual abrasion resistance. Aromatic hydrocarbons, ketones, esters and some chlorinated hydrocarbons will soften the finish but as long as no abrasion occurs, the film will harden to its original state when allowed to dry. The finish is recommended for use on covered hopper cars, tank cars, tank container cars, refrigerator cars and other equipment subjected to similar rigorous service conditions. It is applied with the same equipment and technique normally used to apply a synthetic lacquer or enamel.

●

(Based on Vinylite resins, this acid and alkali-resistant finish, known as Carclad, is produced by the Sherwin-Williams Co., Cleveland 1, O.)

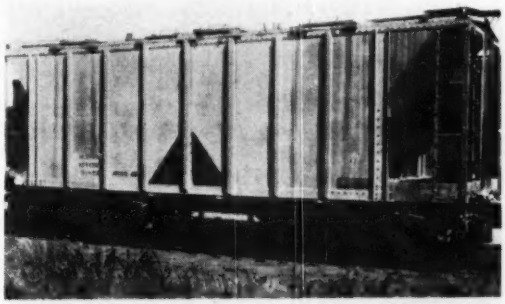
A method for making superior ready-to-use or ready-mixed gold or copper bronzing paints, with increased stability of leafing and improved luster, is described by C. S. Fleming in U. S. Patent 2,474,520. Glycerine serves a useful role in the production of such bronzing materials:

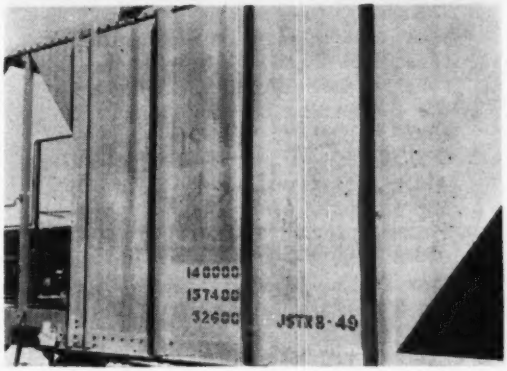
Glycerine	10 gm.
Gold bronze powder	10 gm.
Vehicle 1301	75 gm.

In the above formula, Vehicle 1301 provides an all-purpose vehicle that is neither soft nor brittle and which is very suitable for making bronze paints. It consists of:

Bodied linseed oil	200 gm.
Solution of polymerized resinous material	200 gm.
Petroleum thinner	100 gm.

Glycerine is said to combat the deleterious effects of the stearic acid coating commonly applied to the flaked particles of bronzing powder.





Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *We have a problem in buffing long lengths of tubing in our plant. We wonder whether you can give us an idea of how to build a machine using a number of buffing heads to handle these tubes. The diameters range from ⅜ to 1½ inches, the lengths from 3 to 6 feet.*

S.W.

Answer. One possibility of solving your problem might be the installation of several stands with wooden idler rollers in front of and somewhat below the center line of your buffing machine stands. The operator could feed the tubing past the rotating buffs while it was resting on the wooden idler rollers, using enough physical force to prevent uncontrolled rotation of the tubing. Such a system would be inexpensive but might be more awkward than a 100 per cent hand operation.

There are a number of automatic polishing and buffing machine manufacturers which could either adapt some of their standard models for your particular purpose or could design and manufacture a machine to your exact specifications (names of ten companies furnished).

—— fc ——

Question. *Would you please advise us as to a relatively simple process for blackening nickel silver, the composition of which is 64 parts copper, 24 parts zinc, and 12 parts nickel?*

S. R. B.

Answer. There are a number of proprietary blackening solutions on the market, and for information regarding these solutions we should like to refer you to the following companies (names of six companies furnished).

A coloring process for nickel silver recommended by Hugo Krause

("Metal Coloring and Finishing") involves the use of the following solution:

60 grams arsenic acid dissolved hot in 1 liter of water to which is added 60 grams copper sulfate, 12 grams iron chloride, 12 grams copper lactate, 6 grams ammonium chloride, and 9 grams sodium thiosulfate. The objects should be repeatedly dipped in the cold solution, rinsed in cold water, dipped in a cyanide solution, and again rinsed.

You might also like to consider the possibility of black nickel plating the silver objects, and a new development in that field was described in the January 1950 issue of PRODUCTS FINISHING.

—— fc ——

Question. *We produce large quantities of latch knitting machine needles. The polish on these needles is secured by tumbling them in seashore gravel with just enough lard oil to moisten the gravel. We have used this process for many years with satisfactory results except that we get a certain amount of wear on the ends of the hooks, which should be sharply pointed. It is very desirable for us to eliminate this wear. While it amounts to only a very few thousandths of an inch, the loss of the point of the needle is not desirable. Any suggestions that you may have to offer along this line will be very much appreciated.*

H. D. S.

Answer. It is possible that the excess wear on the ends of the hooks which you are experiencing may be traced to the seashore pebbles being used in the barrel finishing operation. While these tide-washed mineral bits appear to the eye to be very smooth, they all have a definite grain size and this acts as an abrasive in the presence of the lard oil lubricant. It seems obvious that you require a material lighter in weight than steel balls or other shapes, but with a very smooth grain structure along with as much hardness as may be obtained in a mineral form.

One material of a type which might solve your problem, a sample of which is being sent to you, is flint lapstone in ⅛-inch flakes. Flint has practically no grain structure and is often referred to as the "grainless mineral." It has a specific gravity of 2.60 and averages in weight approximately 21 pounds to the peck, from which you will see that it is only about one-fifth the weight of steel burnishing materials, but to all intents and purposes the flint is as hard as steel. Even when operated in a barrel with a simple soap water solution, it quite readily takes on a high surface luster, some of the medium shades resembling minor gem stones. This material, whether used with lard oil or soap water solution, might be the answer to the elimination of wear on the ends of the hooks. Its extreme hardness would prevent chipping off in fine sludge that might work its way into and clog the slot in which the latch operates.

If you find that you could use flint lapstone with a simple soap water solution, then the addition of a small quantity of sodium cyanide to each barrel load of needles to be processed might be expected to give you an even better surface finish and color that is shown on the samples you submitted.

The flint is available in three sizes, 0 to ½ inch, 0 to 3/16 inch, and 0 to ⅜ inch, but we believe that the smaller size would be best for this particular application.

H. L. B.

DO YOU HAVE A FINISHING PROBLEM?

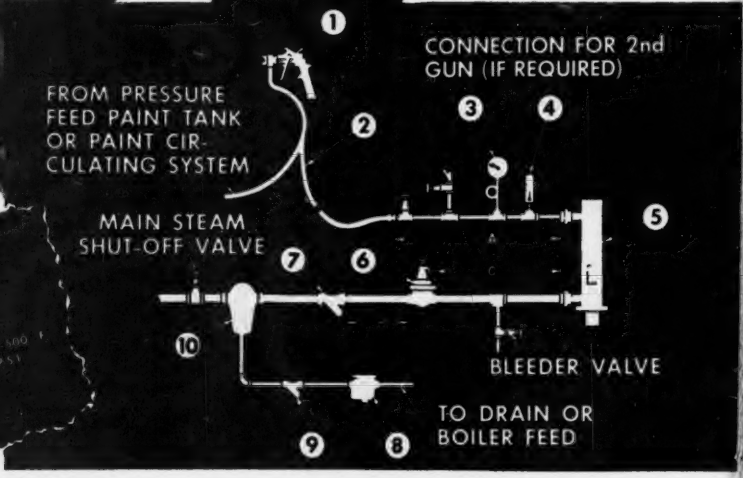
The editorial staff of PRODUCTS FINISHING is prepared to aid you in the solution of your problem.

There is no charge for this service.

Spraying

The Brake Shoe Steam-Spray gun.

Typical steam spray system layout.



Typical elements required for the system.

NO.	QUAN.	PART
10	1	STEAM SEPARATOR
9	2	STRAINER
8	1	STEAM TRAP
7	1	STRAINER
6	1	PRESSURE REGULATOR
5	1	STEAM SUPERHEATER
4	1	MERCURY THERMOMETER 0-500 F
3	1	PRESSURE GAUGE 0-150 PST
2	1	SPECIAL STEAM HOSE
1	1	STEAM SPRAY GUN

KELLOGG DIVISION, 83 HUMBOLDT STREET, ROCHESTER 9, N. Y.

Brake Shoe

SPRAY PAINTING OUTFITS

AIR COMPRESSORS

Finishes with STEAM

CUTS TIME AND COSTS

The revolutionary new spray-painting process developed by du Pont uses superheated steam in place of air to apply finishing materials of higher viscosity in thicker films with one pass of the gun. These coats are surprisingly free from sags, popping and runs.

Operator productivity is increased, cutting time and labor costs. Steam spraying uses less material, solvents and thinners than conventional spray methods.

The steam spraying system may be installed in a production-line operation at moderate cost.

The Brake Shoe Steam-Spray gun makes the process practical for production-line use.

1. Exclusive insulation, heat radiating design, and built-in finger guard assure trigger and handle temperatures which are comfortable to the bare hand.
2. One-piece, easy-to-clean air cap and fluid nozzle are designed to provide uniform distribution of material. Full range of spray width control allows adjustment to any degree desired.
3. Hose support reduces downward torque on head and contributes to the fine balance of the gun.

Brake Shoe will demonstrate this new process in your own plant, or arrange visits to nearby installations. Brake Shoe can supply you with all the equipment necessary for steam spraying.

DOMINION BRAKE SHOE COMPANY, CANADIAN PLANT, NIAGARA FALLS, ONT.

American Brake Shoe Company, Kellogg Division
93 Humboldt Street, Rochester 9, N. Y.

Gentlemen:

Please send me information on steam spraying.

NAME ..... TITLE .....

FIRM .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

Polishing and Plating at

By GEORGE M. KENT
Publicity Chairman
Los Angeles Branch, A.E.S.

REPCAL BRASS MANUFACTURING COMPANY, manufacturer of a complete line of metal plumbing supplies, occupies a large, modern plant in Los Angeles. The company has been engaged in the manufacture of brass goods since its inception, and today produces over 2,000 different items in the one plant.

Founded in 1922 by C. H. Hermann, Sr., the company is operated at present by J. C. Hermann and C. H. Hermann, Jr., sons of the founder. Production operations at Repcal are directed by Ford V. Cowing, plant superintendent. More specifically concerned with the work of the finishing department are Howard Scholl, polishing foreman, and Willard Bestor, plating foreman.

The company employs about 300 persons, and has made a special effort to provide suitable jobs for physically handicapped individuals, fitting them successfully into production operations. Recently, this effort on the part of Repcal was recognized by the United States Department of Labor, and an award from the Vocational Rehabilitation Section was presented to the company.

Polishing Process

Parts to be polished and plated originate in the foundry where sand

Fig. 1—A view of the polishing room at Repcal Brass.

Repcal Brass Manufacturing Co.

castings and brass die castings are produced, and in the machine shop in which rod and tube products and stampings are manufactured. Castings requiring rough grinding are processed in the foundry and routed to the machine shop for machining, if required, prior to being delivered to the polishing room (see Fig. 1).

Steps in the polishing cycle for sand castings are as follows:

1. Polish on 60 emery abrasive belt, dry.
2. Polish on 180 emery abrasive belt, using emery cake or grease stick.
3. Buff on sewed buff wheel, using a tripoli buffing compound.
4. Degrease in vapor degreaser.
5. Color buff with the aid of crocus or white lime buffing compound.

Tube, rod, and sheet products are tripoli buffed, degreased, and color buffed. Brass die castings have a sufficiently smooth surface that the 60 emery polishing operation may be omitted. Brass die cast parts are processed as follows:

1. Polish on 180 emery abrasive belt, lubricated with grease stick.
2. Tripoli buff on sewed buff wheel.
3. Degrease in vapor degreaser.
4. Color buff to final high luster.

A number of parts lend themselves to automatic or semi-automatic polishing and buffing. Flanges, heavy nuts, and cap nuts are buffed on a rotary indexing-type automatic machine employing three buffing heads

Fig. 2—Brass parts are bright nickel and chromium plated on this automatic plating machine.

and eight work holders. Shower heads, stems, handles, and tail pieces are buffed on an Acme semi-automatic buffing machine. Another semi-Automatic buffs flanges.

Plating Operations

The buffed parts are transported to the plating room to join rough finished parts sent to the plating department from the foundry and machine shop. The rough finished parts are those parts to be concealed in the final assembly or completed unit. Such items are nickel plated in a Lasalco plating barrel employing a conventional cold barrel nickel plating solution.

The brightly buffed parts are processed through a bright nickel and chromium plating cycle, carried out in a Lasalco full automatic plating machine (see Fig. 2). Parts to be chromium plated are racked, transported through the complete plating cycle, and then unracked, assembled, and packed for shipment.

The complete cycle in the automatic plating machine is as follows:

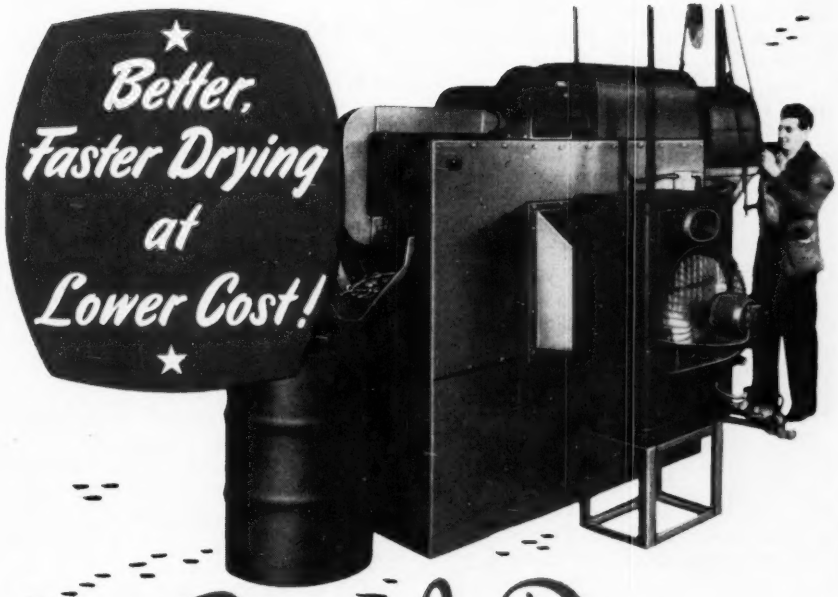
1. Soak clean.
2. Electroclean, reverse current.
3. Cold water rinse.
4. Spray rinse.
5. Cold water rinse.
6. Cold water rinse.
7. Cyanide copper strike.
8. Cold water rinse.
9. Spray rinse.
10. Cold water rinse.
11. Sulfuric acid dip (10 per cent).
12. Cold water rinse.
13. Bright nickel plate.
14. Dragout recovery rinse.
15. Cold water rinse.
16. Spray rinse.
17. Cold water rinse.
18. Cold water rinse.
19. Chromium plate in Self-Regulating High Speed chromium plating solution.
20. Dragout recovery rinse.
21. Cold water rinse.
22. Cold water rinse.
23. Hot water rinse.

Worthy of special note in the above plating cycle is the great care and attention paid to thorough rinsing, thus ensuring that subsequent solutions are not contaminated by solution carried in from previous steps in the cycle.

Cleaning and plating solutions are heated by steam conducted through heating coils, and temperatures are thermostatically controlled. The bright nickel solution is heated by means of an external exchanger.

Weekly control analyses

Fig. 3—(Left to right) Willard Bestor, plating foreman; Robert Cowing, plant engineer, and Howard Scholl, polishing foreman, confer on a finishing problem.
(Photos courtesy Shepard and Kent, Inc., and Repcal Brass Mfg. Co., Los Angeles, Calif.)



LASALCO'S **Spiral Dryer**

- Will save from ½ to ⅔ of each man's time spent on drying operations.
- Automatically and completely dries up to 1600 quarts of parts per hour.
- Unloads automatically into barrels or tote pans, ready for next operation.
- Three-speed spiral through hot air blast provides proper drying time regardless of intricate part design, contours and recesses.
- Re-use of hot air by re-circulation assures unusual fuel economy.
- Can be arranged to take full hopper loads from last hot water rinse without handling.
- Will replace up to 2 or 3 sawdust tumblers plus 2 to 3 centrifugal driers.

SPECIFICATIONS

Over-All Length	7'-6"
Over-All Width	5'-10"
Over-All Height	5'-3" min.
Drum Size	22" dia. x 72" long with 9" screw
Drum Perforations	⅛"
Drying Time	1½ min.—3 min.—5 min.
Production	450 to 1600 qts. per hour (60 to 213 cu. ft.)
Drive	¾ H.P. 3 speed
Blower	½ H.P.
Heater Unit	150,000 B.T.U. (Approx.)
Discharge Chute	20" from floor minimum
Loading Chute	42" from floor minimum
Heating Unit	Steam, Gas or Electric as desired

Send Today For Details & Prices

LASALCO, INC.

2818-38 LASALLE STREET • GRAND 2990 • ST. LOUIS 4, MISSOURI

are performed, and chemical additions to the various solutions are made daily at a rate determined from the results of chemical analysis.

The polishing and plating equipment at Repcal is installed in such a way that maximum performance with a minimum of maintenance may be expected. Further, careful attention is paid to proper equipment maintenance. For example, the rectifiers, which furnish power for the plating operations, are separately housed in a ventilated room. Plating tanks and auxiliary equipment such as filters, pumps, fans, and so on, are inspected regularly. An air-conditioned wheel room for the set-up polishing wheels still in use is maintained.

Repcal executives realize that only by close control of every phase of the forming, polishing, and plating operation, as well as by careful maintenance of equipment, can plated brass products of high quality be produced.

Copper Stripping Non-Dangerously

By WILFRED S. McKEON
Sulphur Products Co., Inc.

OUR product, McKeon's "Liquid Sulphur," an oxidizing and copper stripping agent, was first applied for removing copper from zinc base die castings. A primary consideration for its use for this purpose was the fact that the basis metal was not etched in the process of stripping the copper plate. This stripping agent is likewise harmless to steel when used to strip copper plate from steel products.

Copper plate may be removed through the use of this strippnig agent as follows:

1. Immerse the plated parts in a solution composed of two parts McKeon's Liquid Sulphur and one part water operated at a temperature of 180 deg. F. for 5 minutes or less. In this solution the copper is converted to copper sulfide.
2. Rinse in cold water.
3. Immerse in a sodium or potassium cyanide solution (one pound per gallon), maintained at a temperature of approximately 180 deg. F. The copper sulfide formed in Step 1 is removed in Step 3.
4. Rinse in water and dry.

The above cycle may be repeated as often as is required to convert the copper plate into copper sulfide and then remove the sulfide so formed. Each cycle will remove between 0.0001 and 0.0003 inch thickness of copper plate.

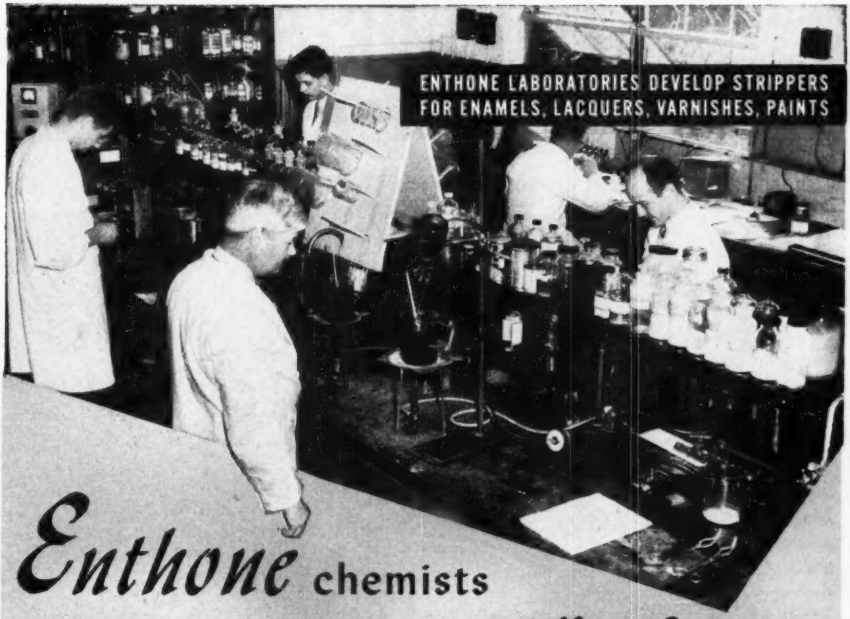
Advantages of the process include primarily the fact that there is no etching of the base metal. Further, since the action is chemical, it takes place with even intensity over the entire surface of the part and is not concentrated in certain areas as would be the case with electrolytic strips. The stripping agent used is harmless to operators' hands and clothing, which is an advantage over the strong acids sometimes employed for stripping copper. Further, there are almost no unpleasant fumes associated with this stripping method.

(Adapted for publication in PRODUCTS FINISHING *from a talk delivered before a meeting of the Allentown-Reading Branch, American Electroplaters' Society, December* 20, 1950.)

Learn about
"COPPER STRIPPING—NON-DANGEROUSLY"

Wilfred S. McKeon

Sulphur Products Co.
Greensburg 8, Pa.



Enthone chemists scientifically select the *Best Stripper* for each *individual* job

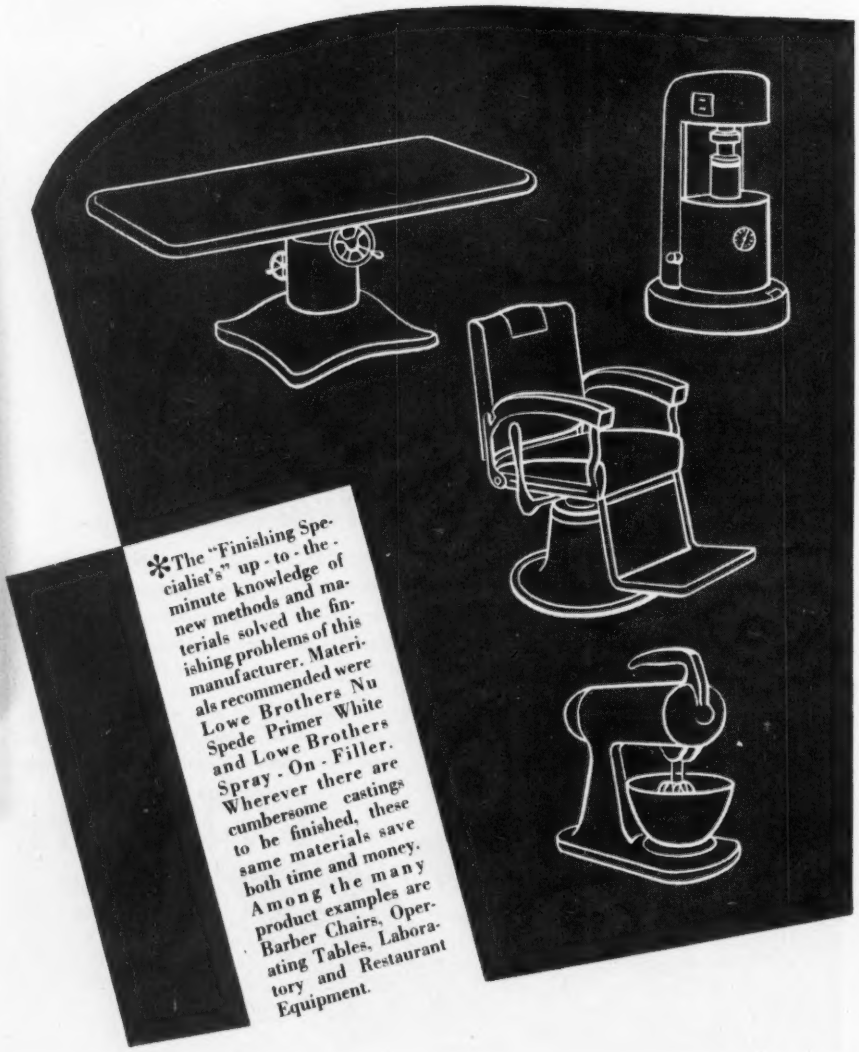
During the past 15 years Enthone has developed over a score of strippers for organic finishes, including nitrocellulose lacquers, alkyd, ureaformaldehyde and melamine synthetic enamels. Some strippers are used straight at room temperatures, require no rinsing and have no odor. Other strippers are used mixed with water. Strippers are available that do not attack any kind of base metal. All provide fast action and economy of operation.

If a standard stripper will not remove the coating on your work, a new one tailor-made to do the job will be formulated. To save time, fill out our questionnaire and return with samples for free laboratory service.

ENTHONE
INCORPORATED
442 Elm Street
New Haven, Conn.

NEW STRIPPER CIRCULAR MAILED ON REQUEST

LOWE BROTHERS
cuts 10 hours off

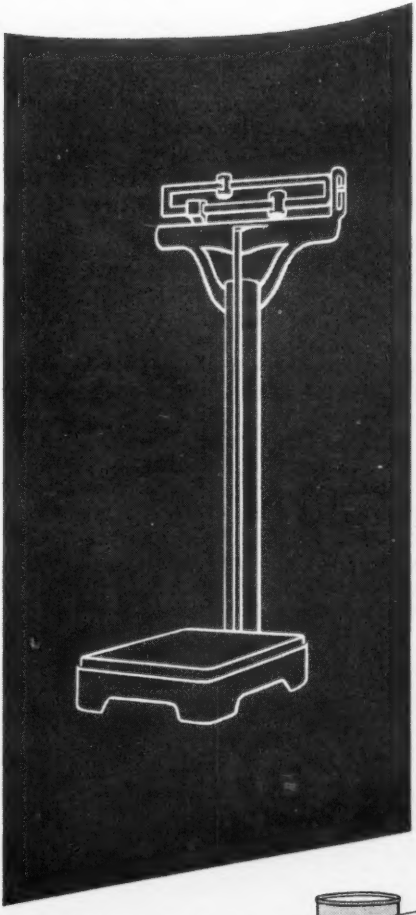


*The "Finishing Specialist's" up-to-the-minute knowledge of new methods and materials solved the finishing problems of this manufacturer. Materials recommended were Lowe Brothers Nu Spede Primer White and Lowe Brothers Spray-On-Filler. Wherever there are cumbersome castings to be finished, these same materials save both time and money. Among the many product examples are Barber Chairs, Operating Tables, Laboratory and Restaurant Equipment.

"FINISHING SPECIALIST"

manufacturer's finishing time...

ave thouand!



This well-known manufacturer of hospital equipment had two big problems in the finishing of large castings: **1.** Each casting required 11 hours' finishing department time. **2.** Oven space was insufficient for speedy production because of baking time required by materials being used. A Lowe Brothers "Finishing Specialist" was quick to recommend that a flash primer* and a spray-on filler* be used. These eliminated the need for a surfacer as well as time-consuming brushing and sanding operations. Separate finishing department operations were cut from 8 to 4! A job that originally took 11 hours per casting was reduced to only 1 hour! *Most important*, the "Finishing Specialist's" suggestions are now saving this manufacturer thousands of dollars a year!

. . . Just one more typical example in the ever-growing number of Lowe Brothers case histories, which prove conclusively that the overall finishing knowledge and experience of Lowe Brothers "Finishing Specialists" are paying off *every day* for manufacturers of all types and sizes. Have a "Finishing Specialist" look into your finishing methods. No cost or obligation. Write today!

INDUSTRIAL DIVISION • THE LOWE BROTHERS COMPANY
DAYTON 2, OHIO

This advertisement is based on facts from Lowe Brothers Industrial Case History Files.

LEADERSHIP THROUGH CONSISTENT SERVICE

Lowe Brothers
FINISHES FOR INDUSTRY

NEW FINISH SYSTEM PROMISES

By GILBERT C. CLOSE

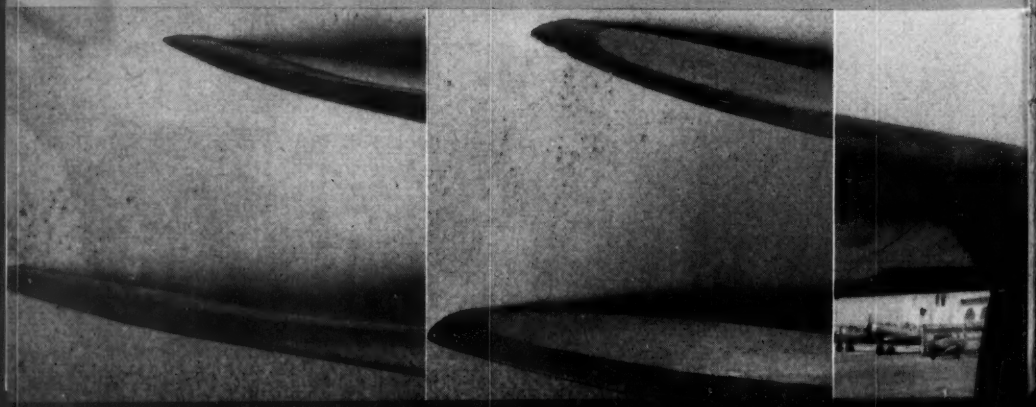
TWO commercially available products have been combined by research engineers at the El Segundo plant of Douglas Aircraft Company into a two-coat finish system that promises a high degree of erosion resistance. This coating will be used on the areodynamic leading edges of high-speed military airplanes to resist the cutting impact of rain, sleet and snow during high-speed flight. Tests with this coating indicate it will serve as well for other uses where high erosion or abrasion resistance is required.

E. D. Mitchell, process engineering paint technician in charge of the investigation, has this to say regarding developments to date: "Though we have not concluded final tests, initial results with this coating have indicated that it is far more resistant to erosion than other coatings now being used. In fact, these tests were so successful that its use is being permitted on naval aircraft pending development of accepted specifications."

The prime coat or base material of the two-coat system is a product of the Minnesota Mining and Manufacturing Company, and is known as EC-843 "Coro-Gard." It is a synthetic-resin material incorporating a new type synthetic rubber which acts as a permanent, non extractible plasticizer. The top coat, EC-940, a pigmented synthetic resin, is a product of the same company. Both materials have been available for some time, but their use together to form an erosion resistant coating for aircraft leading edges, and the method of applying this coating, resulted from Douglas studies.

Fig. 1—Close-up of propeller blades after finishing and prior to test run. Upper blade finished by new method; lower blade finished according to Bureau of Aeronautics Standards.

Fig. 2—Close-up of blades after four-hour test in wind tunnel and water. Upper blade, with new erosion resistant finish, is in much better condition.



HIGH EROSION RESISTANCE

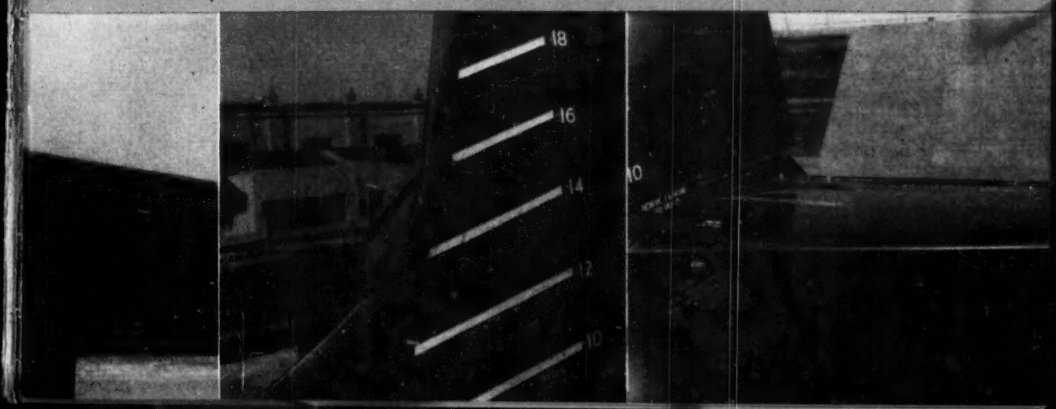
Initial tests at Douglas were made on steel-tipped wood propellers used to draw air and water spray through a wind tunnel designed to test airplane windshields. About 2½ gallons of water per minute are sprayed into this tunnel during operation. This water is sucked into the propeller blades which travel with a top speed of about 400 miles per hour. Impact of the water droplets on the rapidly rotating blades approximates the same conditions encountered by an airplane traveling at the same speed through a rainstorm.

Two of the three two-blade propellers mounted on the wind tunnel drive shaft were used in the test. The leading edges of the metal-tipped blades on one propeller were finished in the usual manner, following the Bureau of Aeronautics' Specification covering the finishing of airplane leading edges. This finish system consists of a coating of zinc chromate primer (Spec. AN-P-656) applied over the cleaned metal to a maximum thickness of 0.0006 inch, a coating of cellulose-type primer-surfacer to a maximum thickness of 0.0008 inch, plus two coats of gloss lacquer conforming to Spec. AN-L-29a.

The second propeller had its leadings edges finished using the Douglas-developed combination of 3M products. The steel propeller tips were first given a phosphoric acid etch. This was followed by a coating of EC-843 approximately 0.0015 inch thick. The top coating of EC-940 was 0.0065 inch thick, providing a total coating thickness of 0.008 inch.

The wind tunnel was placed in operation and the water spray started. In

Figs. 3, 4, 5—Points on airplane where new erosion resistant finish will be used; (left), leading edge of wing; (center) leading edge of vertical fin; (right), leading edge of horizontal stabilizer. (*All photos courtesy Douglas Aircraft Company, El Segundo, California*)



one hour the regulation finish was badly eroded, and at the end of three hours the erosion was complete. There was no indication of erosion of the new finish after one hour, and only very slight erosion was noticeable after three hours. This test was extremely severe due to the fact that the blade tips dipped in running water at the bottom of the tunnel during each revolution.

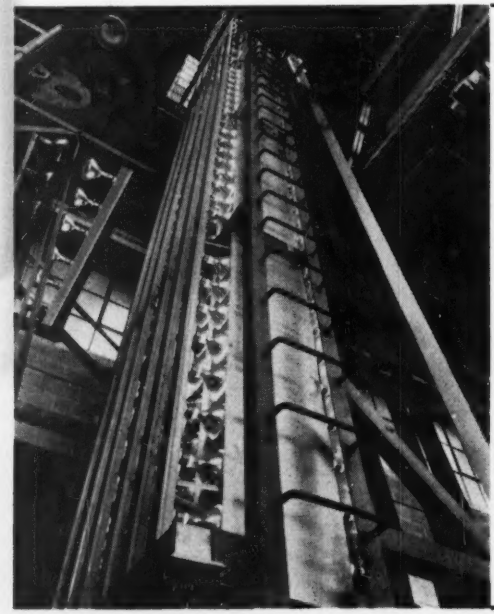
Tests to determine resistance of the finish to extreme thermal shock were also conducted. Coated samples were placed in a cold chamber and subjected to changes from room temperature to 75 deg. F. below zero twice in a period of five hours. No cracking or peeling occurred.

The finish combination withstood also the more conventional tests used in determining finish quality. It passed all specification requirements on flexibility, abrasion resistance, resistance to salt spray, bend tests, and so on. In fact, the abrasion resistance is so high that it is being used on airplane walkways and other portions of the fuselage subjected to severe wear during normal service.

In applying the coating to the airplane's leading edges, the structural aluminum alloys are given the same phosphoric acid preparation as was used on the steel propeller tips.

Though the product manufacturer recommends both EC-843 and EC-940 for numerous industrial protective applications, this combination of the two to produce high erosion resistance promises an even wider scope of uses. It is logical to assume that any finish system that will withstand the severe erosive effects of rain on a high-speed airplane will be useful in numerous applications where finish erosion resistance is required.

For further information on any product mentioned in this issue—use the READER SERVICE CARD between the covers.



TRIANGLE *Infrared Ovens*

BAKE--DRY--PREHEAT

faster, more economically

Made of prefabricated, standardized parts — TRIANGLE INFRARED OVENS can be installed at floor or ceiling levels—used for batch jobs or with a conveying system.

Scientifically designed for economical, safe operation, TRIANGLE INFRARED OVENS can be used to complement or supplement present heating — changes can be made to meet production demands with a minimum of time, effort and cost.

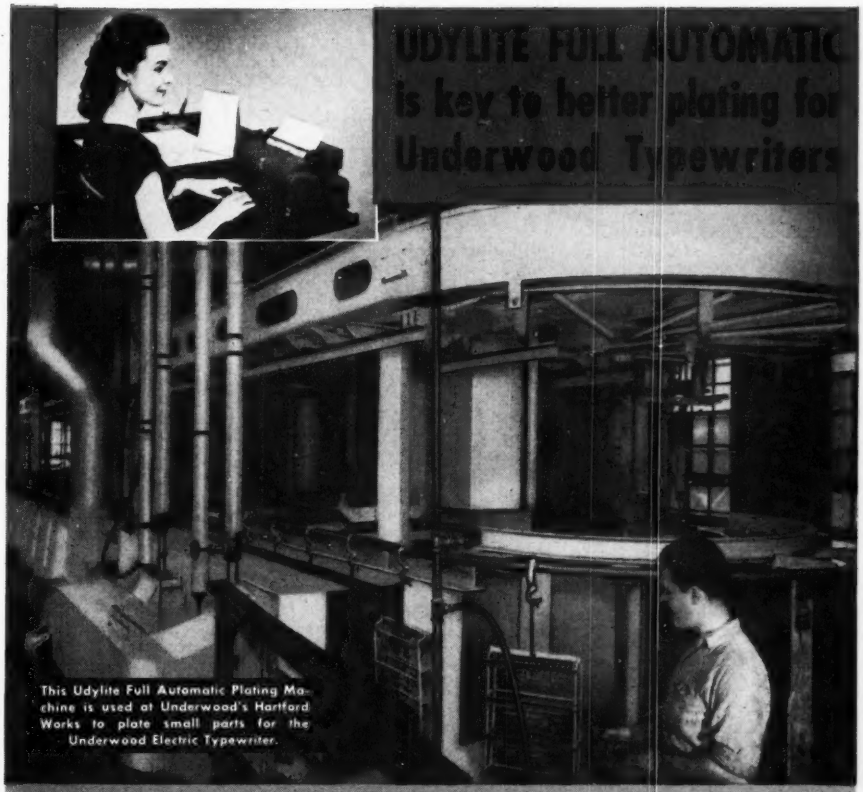
A time and temperature test of your product will be made without cost.

A bulletin upon request.

TRIANGLE EQUIPMENT CO., INC.

Designers, Engineers, Manufacturers

45 River Road Nutley, New Jersey



This Udylite Full Automatic Plating Machine is used at Underwood's Hartford Works to plate small parts for the Underwood Electric Typewriter.

Another great name in American Industry—the Underwood Corporation—has found Udylite equipment and processes supply a ready answer to plating problems. Underwood reports—since installation of their new Udylite Full Automatic Plating Machine for Bright-Nickel application to typewriter parts—that rejects have been virtually eliminated and hand buffing operations on many small parts are now no longer required. This is in addition to a substantial saving in manpower over their previous equipment.

The Udylite Full Automatic offers: (1) Modern, simplified design; (2) Rugged, integrated frame and base; (3) Hydraulic lift and transfer mechanism; (4) Independent lift and transfer controls.

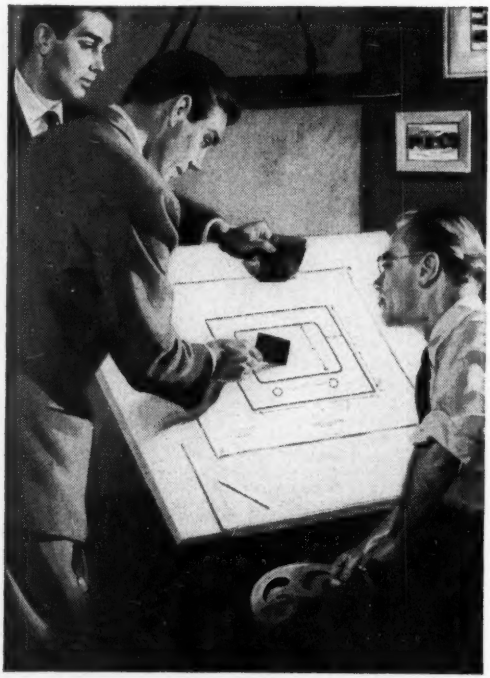
Let your Udylite Technical Man show you how Udylite methods and machines can bring tangible benefits to your plating operations. Call him in today. There's no obligation. Or write direct to *The Udylite Corporation, Detroit 11, Michigan.*

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

Looking for a

CALL YOUR



For a competitive sales feature that's hard to beat, give the customer one he can *see!* Your Industrial Finishes Specialist can help you give *product appearance* a needed sales stimulus, *cut production costs* at the same time.

This is just one Industrial Finishes product success story.

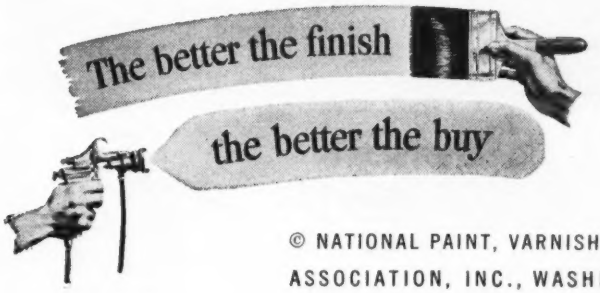
Whatever your finishing problem . . . and especially if you are engaged in vital defense work, you'll find it pays to consult an Industrial Finishes Specialist. He's the technically trained, production and sales-minded representative of your Industrial Finishes supplier.

To speed up production time, reduce costs, call him in at the design and production planning stage. Remember, more and more of your customers *start buying with the finish in mind!*

competitive sales feature?

INDUSTRIAL FINISHES SPECIALIST!

"Hammered" finishes have unusual consumer appeal, compared to ordinary monotone metal finishes, and are adaptable to a wide range of products. But the old two-spray method made costs prohibitive for many. Industrial Finishes Laboratories have developed new finishes that can be applied in one operation, cutting finishing costs substantially!

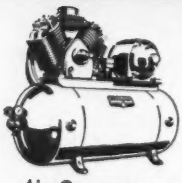


© NATIONAL PAINT, VARNISH AND LACQUER ASSOCIATION, INC., WASHINGTON, D. C.

DE VILBISS

Better finishes at lower cost

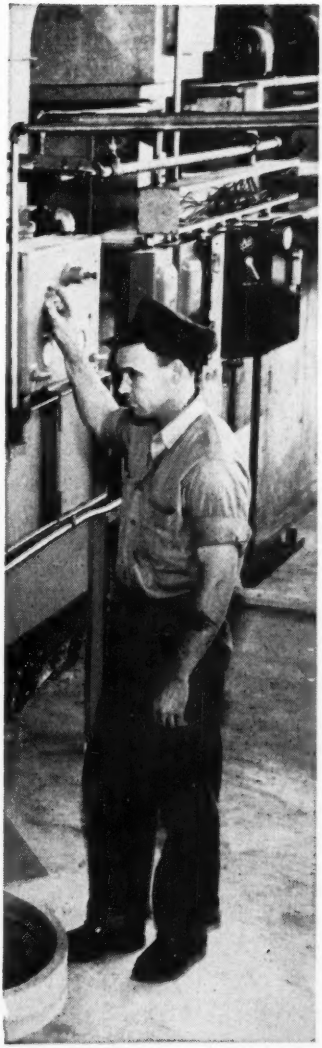
DeVilbiss service and quality products—Spray Equipment, Exhaust Systems, Compressors and Hose—have helped many manufacturers like yourself finish their products better, in less time and at lower costs. Let us show you how. A phone call or letter from you may be the beginning of an important product improvement in your business. There's no obligation, of course.



Air Compressors

Hose and Connections

Spray Guns



THE MACHINE THAT SPRAYS SILENCE

Acoustical tile is the name of those square panels you see coming through this DeVilbiss Spray Booth.

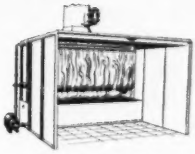
The panels have just been coated with a casein material and, when installed, they'll soak up noise like a sponge.

The coating on this job must be absolutely uniform. And that's where DeVilbiss comes in.

This DeVilbiss horizontal transverse machine, with a special down-draft, dry-type exhaust, is equipped with 2 internal mix guns spaced 33" apart. The work passes under them at the rate of 50 to 60 feet per minute. It's top quality production spraying done with peak efficiency that can be utilized in many finishing processes.

Product improvement through better finish is typical of DeVilbiss service and products—Spray Equipment, Spray Booths, Compressors and Hose. Call a DeVilbiss branch office for complete information.

THE DEVILBISS COMPANY
Toledo, Ohio
Windsor, Ontario • London, England
Santa Clara, Calif.
Branch Offices in Principal Cities



Spray Booths

FOR BETTER SERVICE, BUY
DEVILBISS

Spotlighting FINISHING Progress

Evaporation Rates of Solvents and Thinners in Organic Finishes

By DR. ALLEN G. GRAY

THE solvent and diluent portions of organic finishes have an important effect on the character of the final film which is actually formed during their removal. In production finishing, drying the coating after it has been applied to the product is of utmost importance, since it largely determines the speed at which the products can be finished. The effect of rates of evaporation of solvents and thinners upon the film properties of coating compositions is of recognized importance and ranks along with solvent strength and other physical properties as important points to be considered in selection of suitable materials for industrial finishes.

Organic coatings dry by one or more of the following mechanisms: (1) evaporation or loss of solvent; (2) oxidation; (3) polymerization. When a coating material is applied to a surface, the first thing that takes place is evaporation of the volatile ingredients. Some finishes, such as lacquers, dry completely by evaporation of solvents. After evaporation of the volatile ingredients, a finish which does not dry solely by evaporation is still in a semi-fluid state, and they may depend upon either oxidation or polymerization, or a combination of both, to convert them to a hard, permanent finish.

Many workers in the field of protective coat-

•

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

ROBINSON'S *Assayed* GOLD PLATING SOLUTIONS and SALTS

PALLADIUM · RHODIUM

for SPECIFICATION PLATING

WHERE CLOSE TOLERANCES ARE DEMANDED

Ideal for Government Contract Work in the field of Electronics, Scientific and Optical Instruments and all Industrial and Decorative uses.

Robinson's complete line of Assayed Precious Metals are available to industry and the jewelry trade, in all quantities—by Troy or Avoirdupois with metal content guaranteed. Karat and Alloy Golds, both liquid and salt, come in all degrees of hardness—and in all shades. For a hard, white, durable finish, specify Palladium or Johnson-Matthey Rhodium. Send on your samples for free matching and testing.

A. ROBINSON & SON

"70 Years in Precious Metals"

131 CANAL STREET NEW YORK 2, N. Y.

CAnal 6-0210—0464

A. ROBINSON & SON, 131 Canal St., N. Y.
Please send information on Robinson's Assayed Gold Plating Solutions ☐, Potassium Gold Cyanide ☐, Rhodium Solutions ☐, Booklet: "Precious Metal Plating" ☐.

Name..... Street.....

City..... State.....

ings have emphasized the importance of tests on evaporation rates of solvents and thinners as among the most important in controlling and judging the performance of finishing materials. In the case of lacquers it has been pointed out that such data can furnish a measure of the relative drying times, and as a consequence give valuable information pertaining to probable flowing-out characteristics and blush resistance of the drying film. (See also "Ind. Eng. Chem." Anal. Ed. 7, 278, 1935.) It has been stated that other factors being constant, the blush-resistance varies inversely with the rate of evaporation of the solvents. Flow, although not a function of the volatility alone, is governed by it to a considerable extent. The maintenance of the proper balance between active solvents and diluents during the drying process is regarded as important from the standpoint of film characteristics; this is largely determined by the relative rates of evaporation of the active and inactive components of the solvent system.

In formulating thinners and lacquers, data are needed on the relative rates of evaporation of the various solvents and diluents in order to determine whether, in the practical application of these materials, their initial solubility relations for nitrocellulose and resins may be disturbed during drying. If a proper balance of solubility is not maintained throughout the drying of the lacquer, the solid ingredients may be precipitated with a consequent loss of the desirable qualities of the resulting film. (See also "Ind. Eng. Chem." 28, 312, 1936.)

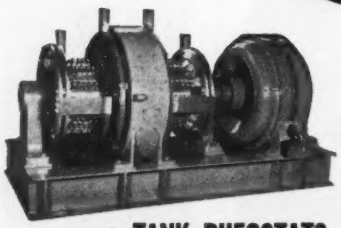
Work recently conducted in the Shell Development Laboratories has resulted in the Shell Evaporometer, a new instrument for determining the evaporation of solvents and thinners as thin films from relatively large surface areas. The development and ap-

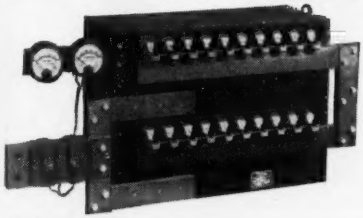
COLUMBIA

MOTOR GENERATORS

for

Electroplating, Anodizing
Electrocleaning, Electropolishing





• TANK RHEOSTATS
• REVERSING SWITCHES
• TONG TEST AMMETERS

Write for Descriptive Bulletins

COLUMBIA ELECTRIC MFG. CO.

4535 HAMILTON AVE. • CLEVELAND 14, OHIO

-TO-BLACK you just can't beat...

The Best Black Finish FOR IRONS AND STEELS

Make These BLACK-TO-BLACK Comparisons:

JETAL for SPEED—(Goes on in just 5 minutes)

JETAL for PERMANENCY—(Won't chip, peel, crack off or dust off even if bent or cut)

JETAL for ECONOMY—(Costs LESS!)

JETAL for EASY OPERATION—(Goes on by immersion bath—no current)

JETAL for PROTECTION (Gives greater wear resistance, consistent quality, added toughness, longer life!)

For *plus* protection — apply JETOIL 1 *after* JETALIZING metals . . . it's the all-around oil-type after-coating.

Make these BLACK-TO-BLACK COMPARISONS without cost . . . have iron or steel samples JETALIZED . . or ask for a plant demonstration.

ALROSE CHEMICAL CO.

PROVIDENCE, RHODE ISLAND — Williams 1-4000-3081

Hand Protection for Every Worker ... on every job!

WITH U. S. DIPPED CANVAS UTILITY GLOVES AND DIPPED NEOPRENE GLOVES

Many lost man hours can be saved when your workers wear U. S. Dipped Canvas Utility Gloves. They reduce time losses caused by splinters, cuts, abrasions, acids and disinfectants. Good flexibility, soft flannel lining and curved fingers make for perfect comfort. Gauntlet or knit wrist style.

For the utmost in safety, comfort and economy, specify U. S. Dipped Neoprene Gloves. Curved fingers, roughened surface for positive grip. Both styles at your nearest U. S. Rubber Branch.

U.S. Industrial GLOVES

UNITED STATES RUBBER COMPANY

plications of the new instrument, which measures evaporation rates under conditions of their use in organic finishes, was described in a paper by R. J. Curtis, J. R. Scheibli, and T. F. Bradley before the Division of Paint, Varnish and Plastics Chemistry at the 115th Meeting of the American Chemical Society, and which has since appeared in "Analytical Chemistry." The instrument is available from Precision Scientific Company, Chicago, Ill., manufactured under license from Shell.

A survey of methods available for determining rates of evaporation revealed that few, if any, of the conventional methods provide ratios of evaporation surface areas to volume of evaporating liquid which approach those that occur in the practical use of organic coatings. Thus, there appeared to be a need for an instrument which would measure evaporation rates of solvents and thinners under the conditions that the majority of coating formulators and users are most interested in; namely, as thin films from relatively large surface areas and at ordinary temperatures and humidities, because such conditions would most closely simulate production conditions.

The technique of the new method is applicable to all liquids of low viscosity, including solutions of film-forming materials, such as resin solutions, from which an indication of solvent release characteristics of various solvents may be obtained. This work in the Shell Laboratories has served to emphasize that atmospheric humidity, the nature of surfaces from which liquids are permitted to evaporate, and the chemical constitution of solvents and solutes are significant factors in thin film evaporation.

Mechanism of Solvent Evaporation

The speed or force with which a solvent evaporates is related to what is called its vapor pressure. To put it

Remove { PAINTS AND HIGH BAKED ENAMELS

FASTER

and Cleaner TOO!

KLEM Strip-Aid

Patent applied for

KLEM Chemicals Inc.
14401 LANSON . . DEARBORN, MICHIGAN

Please send experimental sample of Klem STRIP-AID.

Company_____
Name_____
Title_____
Street_____ State_____
City_____

A remarkable new additive that speeds the action of your paint stripper.

KLEM Strip-Aid gives you more complete and cleaner stripping. Salvages paint rejects that have previously been too costly to handle or impossible to strip. Cuts stripping time in half.

Especially effective for removing accumulated paint from handling equipment.

simply, vapor pressure may be thought of a measure of the internal forces that tend to drive off the surface molecules into the air in vapor form. These internal forces vary with the nature of the solvent and the non-volatile base; they are also vitally influenced by external conditions.

The molecules of a liquid are in constant motion, possessing an average speed which depends upon the temperature. A certain percentage of the molecules will be moving faster and another percentage slower than the average. As the molecules approach the surface, if they have sufficient speed, they are able to leave the liquid film in the form of vapor. The liquid is then said to be evaporating. Thus, the higher the temperature the faster the evaporation process.

If the relatively high speed molecules are continuously leaving the liquid film by the process of evaporation, then the average speed of the molecules remaining in the liquid is reduced. Since temperature has a direct relation to the average speed of the molecules, it can be seen that the evaporation process is accompanied by a lowering of the temperature of the liquid. If the reduction in temperature of a lacquer film is sufficient to cause condensation upon the film of the water vapor in the air, precipitation of the ingredients in the finish may occur. This phenomenon is commonly known as one form of blushing.

While accurate data on the relative rates of evaporation for solvents and diluents are valuable to the finish formulator, care must be taken in attempting to predict the rate of evaporation of a mixture of lacquer liquids from knowledge of the evaporation rates of the component materials. Thus, one should bear in mind that the evaporation rate of a liquid is not necessarily the same as the evaporation of the liquid from a paint coating. Solvation, lowering of vapor pressures of mixtures, surface tension and other factors have been reported to distort this relationship. These factors account for the importance of direct determinations of the evaporation rate.

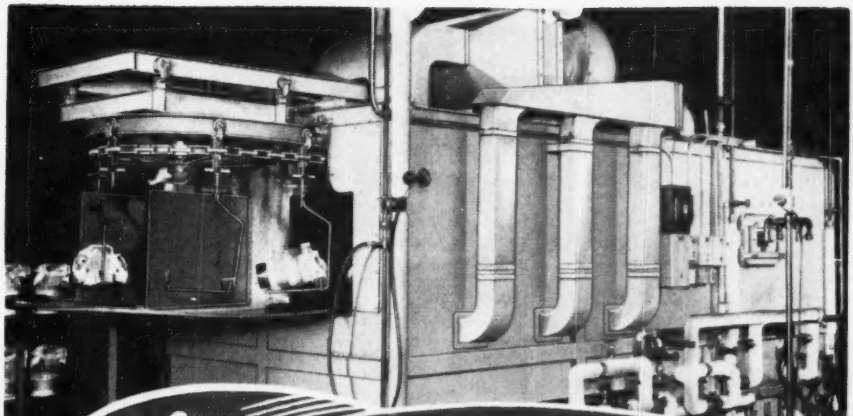
External conditions other than temperature may have an important part in determining the speed of evaporation of a given solvent, and thus the rate of drying of an organic finish.

Principle of the Shell Evaporometer

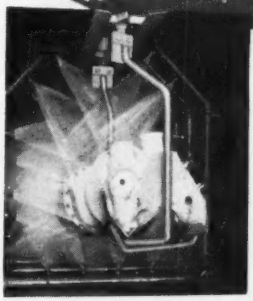
In using the new evaporation rate instrument, an accurately measured volume of sample (0.7 ml.) is dispensed at a uniform rate during a period of 15 seconds onto a filter paper cone, suspended on a calibrated quartz spring, that is rotated at the rate of 4 r. p. m. Air at 77 deg. F. and 50 per cent relative humidity is passed over the cone at 21 liters/min. and readings are made of the elongation of the quartz spring at convenient intervals as the sample evaporates and the cone

to Page 48

Advanced
BARREL FINISHING
Advanced
BARREL FINISHING
FREE
22 PAGES OF FACTS
This 22-page booklet is guaranteed to open your eyes! It gives you the inside story of advanced barrel finishing as never told before!
WRITE TODAY FOR YOUR FREE COPY
ALHCO Supersheen
AMERICA'S LARGEST MFR. OF ADVANCED BARREL FINISHING EQUIPMENT, MATERIALS & COMPOUNDS
ALBERT LEA, MINNESOTA



How a Bomber Engine Plant Cleans Aircraft Engine Cylinder Assemblies



IT WAS with great pride that we cooperated with engineers of a large automobile company to design and build this A-F Equipment for speed-cleaning, rinsing and drying cylinder heads and head and barrel assemblies for aircraft engines.

The conveyor operates as a continuous loop so that it can be loaded and unloaded at the same end.

The close-up photograph clearly shows the trolley swivel attachment equipped with star wheel which turns the parts as they pass through the complete coverage of high-pressure spray. There are many other features. Write for details or a consultation regarding your metal products cleaning and finishing problems—today!

THE ALVEY-FERGUSON COMPANY

624 Disney Street *Established 1901* Cincinnati 9, Ohio

Offices or Representatives in Principal Cities—Coast to Coast

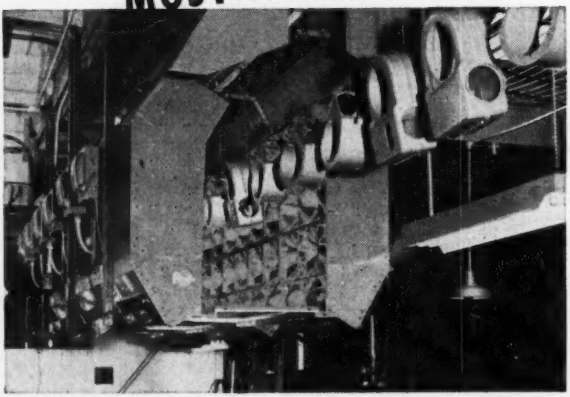
CONVEYING EQUIPMENT

Alvey-Ferguson

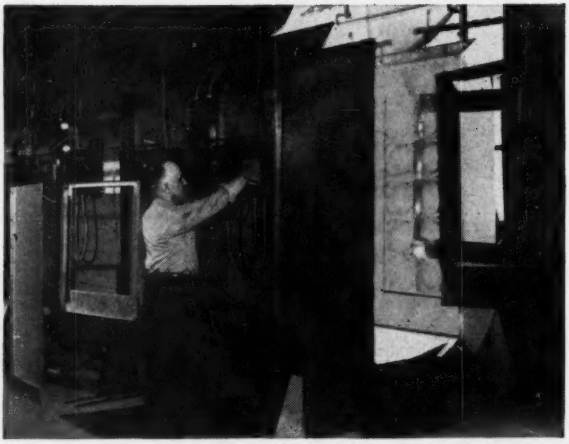
WASHING MACHINES FOR INDUSTRY

THOUSANDS OF PLANTS Switch to MOST EFFICIENT OF ALL

TYPICAL OF THOUSANDS OF FOSTORIA INSTALLATIONS REPLACING FORMER HEATING OR DRYING METHODS



Automatic Burner Corp. of Chicago now finish bakes oil and gas burners with Fostoria Infra-red. Here the light weight Fostoria oven is suspended from the ceiling, saving considerable floor space. The conveyorized system saves much handling. 350 units are now turned out in 8 hours compared with 150 units previously, and finishes are more durable and attractive. No heating up time is required — production is instantaneous with complete flexibility of control.



"When you have limited floor space and want to get out maximum production, this is the only efficient way to do it," says H. O. Buschman, Plant Engineer at Perfection Stove Co., Cleveland. The Fostoria oven requires only half the floor space previously needed for a fuel fired oven. A variety of furnace panels, bases, etc. are now finish baked in 6 minutes at the rate of 80 pieces per hour. The flexibility of the Fostoria oven permits switch control of each bank for full or half voltage to vary heat intensity according to production requirements. All handling is eliminated except at inspection and transfer points.

THE FOSTORIA PRESSED STEEL

FOSTORIA INFRA-RED

INDUSTRIAL OVENS FOR FINISH BAKING

Throughout industry, new high standards of production efficiency are being set by the utilization of the Fostoria Infra-red System. Savings in "per piece" production cost are substantial with many additional advantages on both large and small operations. *A Fostoria Evenray System will out-perform any other equipment on the market today.* Fostoria engineering combined with exclusive equipment features guarantee the fastest, finest finish baking in a minimum of space at lowest operating cost. Investigate what Fostoria Infra-red can do for you. Case histories of installations applicable to your production are available on request.

SAVES SPACE

Fostoria Infra-red ovens operate on a comparatively short cycle which results in smaller oven requirements. They may be suspended from ceiling mounts to eliminate floor space entirely.

SAVES TIME

Reduces processing time from hours to minutes because of the inherent speed of Infra-red. There is no time lag in starting an oven. Heat is instantaneous.

SAVES MANPOWER — MANHOURS

Ideal for conveyorized production methods. Reduces expensive product handling. Turns out more pieces per day with ease, with less people.

CUTS COSTS

Faster production, lower operating costs, improved quality, result in lowest "per piece" cost.

★ A Fostoria representative will gladly analyze your production *needs* and submit definite recommendations and carefully forecasted results for your consideration.

Get the **FACTS**

Write, today, for this factual folder on the Fostoria Infra-red System. Technical data applicable to your operations will be included if you send us general facts about your problems.

CORPORATION, Fostoria, Ohio

Oldest and Largest Manufacturers of Industrial Infra-red Ovens

INFRA-RED fostoria SYSTEM

returns to its original or no-load position. From these readings, knowing the zero point, volume of sample, density of the sample, and the spring constant (grams per cm. elongation) the

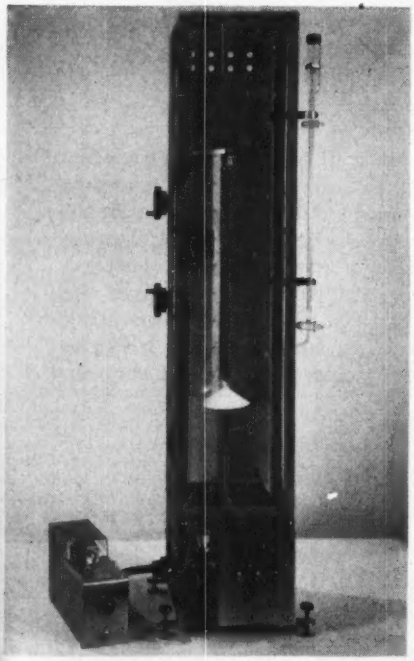


Fig. 1—The Evaporometer developed and used in studies conducted in the Shell Laboratories. (*Photo courtesy "Analytical Chemistry"*)

weight per cent evaporated at each reading can be plotted as a function of time.

The apparatus used in the Shell Laboratory is shown in Fig. 1; it consists of a Jolly balance type of instrument enclosed in a cabinet through which downdraft air circulation at 21 liters per minute is maintained by means of a vacuum line, and a rotameter to measure the flow of air accurately. The quartz-fiber spring is supported through a swivel connection to a supporting arm, which can be raised or lowered from outside the case to compensate for cones of different weights and samples of a wide range of specific gravities. The filter paper cone is supported below a horizontal sighting disk on a wire frame which has a hook on the upper end for fastening to the quartz spring and a triangular soft iron armature on the other end that fits into a shallow triangular opening in the Bakelite cover of a rotating electromagnet protruding from the base of the case.

The mirror and millimeter scale, which can be raised and lowered from outside the case to facilitate accurate setting of a zero point, are in a position directly behind the spring and cone assembly, so that when in perfect alignment the sighting disk and its image can be superimposed on each other with the left-hand edge of the disk slightly overlapping the scale. The microburet, 1-ml. capacity, has an offset tip that projects into the cabinet through a sliding window device, so that it can be swung directly over the cone to dispense the sample and then pushed back against the scale so as not to interfere with the freely hanging cone during the evaporation of the sample.

The cones for the Shell Evaporometer are constructed from 11-cm. disks of No. 4 Whatman filter paper by removing a 75 deg. segment, gluing the upturned edges with a water soluble glue, and then trimming off the excess paper about 2 mm. above and parallel to the surface of the cone. To avoid errors due to changes in moisture content of the filter paper, the cones should be conditioned overnight under the specified conditions of the test. Quartz-fiber springs, suitable for use, may have elongations between 11 and 15 cm. per gram load, or spring constants from 0.091 to 0.066. A typical spring of this type is approximately 17.5 mm. in diameter, composed of 38 spirals of quartz about 0.4 mm. in

to Page 52

SPECIFIC COMPOUNDS
For SPECIFIC NEEDS

NICKELEX STRIPPER

A cyanide, alkali mixture which strips Nickel from Steel bases by a simple immersion process. Has no effect on Steel base metal. Can be used in plain Steel equipment at room temperature.

METEX

Special foundations, individually compounded for specific uses with direct current.

ANODEX

The original reverse current smut-removing cleaner for Steel.

DYCLENE

A highly buffered alkaline salt used for reverse current cleaning of zinc dye casting and brass, copper and steel.

Send For Free Data Sheets

ROCHELTEX

Copper Addition Agent that can be added to any cyanide copper solution. Cuts cyanide consumption up to 50% — increases cathode efficiencies 20%. Carbonate buildup may be completely eliminated.

THE ALUMETEX PROCESS

New, improved process for electroplating on Aluminum.

Also

Write for our new Data Sheet Catalogue on Cleaners, Strippers, Additives and Processes and specific Data Sheets for specific needs.

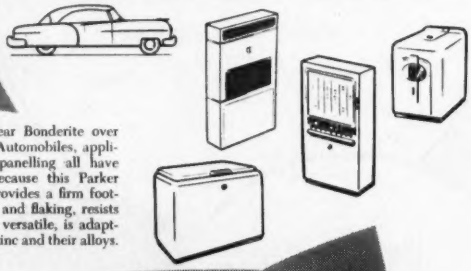
MAC DERMID
★ *Incorporated* ★
WATERBURY 20, CONNECTICUT

COMPLETE SUPPLIERS TO
THE METAL FINISHING INDUSTRY

Parker Products...

BONDERITE

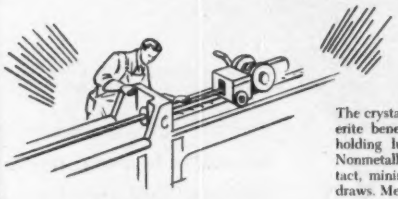
To anchor paint, preserve fine appearance



The best looking paint jobs wear Bonderite over the metal and under the paint. Automobiles, appliances, metal furniture, metal panelling all have longer lasting paint finishes because this Parker corrosion resistant paint base provides a firm foothold for paint, prevents peeling and flaking, resists rust and corrosion. Bonderite is versatile, is adaptable for use on steel, aluminum, zinc and their alloys.

To make drawing smoother, easier

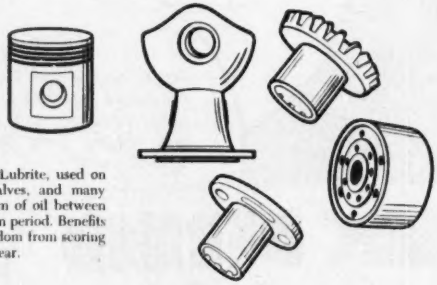
BONDERITE



The crystalline phosphate coating created by Bonderite benefits drawing and forming operations by holding lubricant even under extreme pressures. Nonmetallic Bonderite prevents metal-to-metal contact, minimizes galling and scoring, allows deeper draws. Metal polishing costs are reduced by treating with Bonderite before forming.

PARCO LUBRITE

To resist wear on friction surfaces

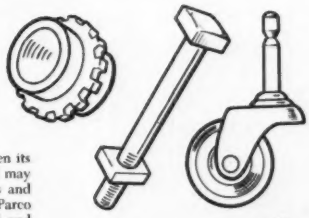


Oil absorbent, nonmetallic Parco Lubrite, used on pistons, cylinder walls, gears, valves, and many other bearing surfaces, holds a film of oil between moving parts in the critical break-in period. Benefits are faster, smoother break-in, freedom from scoring and scuffing; longer subsequent wear.

for metal treatment and metal finishing

PARCO COMPOUND

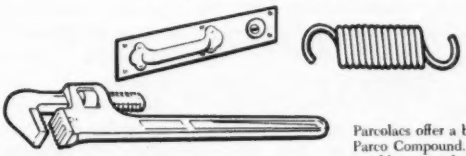
For effective rust resistance



For a third of a century, this product has given its protection to iron and steel. Parco Compound may be used on wrought iron, stampings, castings and sheets. It stoutly resists rust and corrosion. Parco Compound is simple to use, easy to control and economical.

For excellent special finishes

PARCOLAC



Parcolacs offer a broad line of finishes for use after Parco Compound. Among them are stains that dry quickly to a soft, matte black which is handsome, long-wearing and easy to handle and apply. Other specialized finish requirements find their answer in Parker Parcolacs.

PARKER PRODUCTS MEET GOVERNMENT SPECIFICATIONS

SPECIFICATION	PARKER PRODUCTS
JAN-C-490, Grade I	Bonderite 100, 125, 140, 160, 170, 180
JAN-C-490, Grade II	
Type 2	Parco Cleaners 341, 350, 371
Type 4	Parco Cleaners 250 and 260
Type 5	Parco Cleaners 210 and 220
Type 6	Parco Cleaners 100, 101, 110
JAN-L-548	Parco Compound—Parco Powder
U.S.A. 57-0-2	
Type II, Class A and Class A1	Parco Lubrite 1, 2, 3
Type II, Class B	Parco Compound—Parco Powder
Type II, Class C	Bonderite 32, 34, 100, 125, 140, 160, 170, 180
U.S.A. 50-60-1C	Bonderite 100, 125, 160, 170, 180
U.S.A. 3-213	
Type I	Parco Cleaner 250
Type II	Parco Cleaner 260
AXS 1245	See JAN-C-490
QQ-P-416 Type III	Bonderite 32, 34
Navy Aeronautical M-364	Parco Compound—Parco Powder

PARKER RUST PROOF COMPANY
2172 E. Milwaukee • Detroit 11, Michigan

WANT MORE INFORMATION?
Call or Write Today!

Parker Rust Proof Company
2172 E. Milwaukee, Detroit 11, Michigan

Please send me complete information on the Parker Products indicated below:

☐ Bonderite ☐ Parco Lubrite ☐ Bonderite as an aid in drawing
☐ Parcolacs ☐ Parco Compound ☐ Gov't. Spec. No. _____

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

diameter, and has a free hanging length of approximately 8.3 cm. Calibration of the spring is accomplished by suspending a small metal pan on the spring, and loading it with analytical balance weights in increments of 0.1 gram until a total load of 2.5 grams is obtained. The load vs. elongation curve is then plotted and the spring constant (total load-total elongation) calculated.

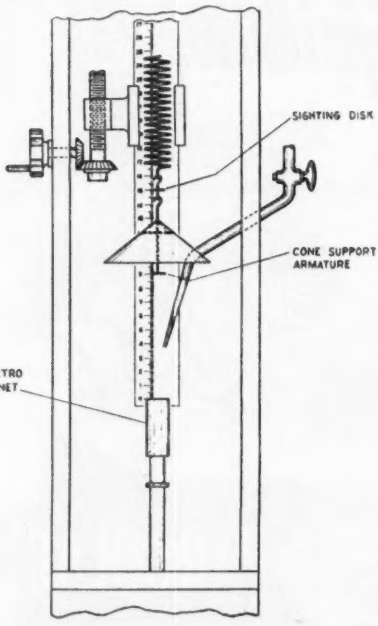


Fig. 2—Spring and cone assembly in the Evaporometer showing first step in setting no-load point.
(*Illustration courtesy "Analytical Chemistry"*)

Determining the Evaporation Rate of a Volatile Solvent

The Shell research workers recommend, for purposes of standardization, that evaporation tests be conducted in a room conditioned to 50 per cent relative humidity at a temperature of 77 deg. F. or that auxiliary equipment be provided to produce these conditions in the Evaporometer cabinet. The instrument, for proper operation, must be level and must have the necessary adjustments made, so that with the cone and spring in position, the armature of the cone support is centered directly above the shallow opening in the electromagnet. The source of vacuum should be connected in series with a dry ice-acetone cold trap to prevent the drawing of solvents into the vacuum system. With these adjustments made, the total elongation which will be caused by the 0.7 ml. sample is calculated using the following equation:

$$\text{Spring elongation} = \frac{(d_1)\quad(0.7)}{C}$$

where d_1 is density of the sample in gram/ml. at 77 deg. F. and C., is the spring constant, in gram/cm. elongation.

Next, the filter paper cone is suspended on the spring and a correction for sample volatility is made by raising or lowering the zero point of the scale the correct distance from a point level with the top of the electromagnet. This correction is dependent on the volatility of the solvent and generally varies from +3 mm. to —20 mm. A minus correction is made only with fast evaporating samples to compensate for the amount of sample evaporated before the cone is released, thus preventing excessive spring vibration; while a positive correction, which increases the spring tension when the armature is in contact with the electromagnet, is made only with slowly evaporating materials to ensure release of the cone when the magnet is turned off. Figure 2 illustrates the first step in setting no-load point.

The cone is then adjusted so that the scale reading, corresponding to the total elongation due to the sample, coincides with the position of the armature of the cone support. Then in order to use the sighting disk during the test, the scale is raised so that this

What's good grooming for a golf shaft?

...a brush!

Prior to plating, golf shafts must be perfectly clean, free of heat-treat discoloration and surface imperfections. In cleaning and finishing, the problem was to get into the corners of the tapered True Temper "step-down" and to do the job in one pass at high speed.

The problem was solved with a five-station, in-line automatic machine equipped with Osborn Fascut® Brushes. This automatic brushing gives the shafts a smooth, uniform finish over the entire surface . . . and it has increased output 20% over the former method.

Perhaps new Osborn brushes and brushing techniques can improve *your* products and step up your productivity. An **O**sborn **B**rushing **A**nalyst will gladly survey your operations. Write today for an **OBA!** *The Osborn Manufacturing Company, Dept. 392, 5401 Hamilton Ave., Cleveland 14, Ohio.*

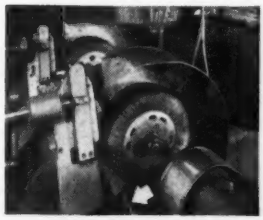
OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS

Osborn Brushes step up finishing output 20%

The problem here was to remove heat-treat discoloration and surface imperfections from golf shafts prior to plating. Due to the tapered True Temper "step-down" design of the shaft, it was difficult to get into the "step-down" corners with the former method. Two or three passes were required for thorough cleaning.

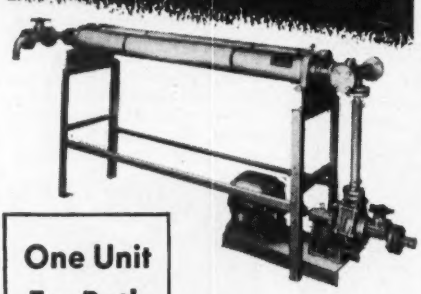
Now, with the five-station machine shown above, Osborn Fascut® Brushes, with compound, finish the shafts in one pass, netting a 20% increase in output. Uniform quality of finish over the entire surface is duplicated accurately from piece to piece due to the ability of the Fascut Brushes to blend with the exact contour of the golf shaft.



Brushes run at 900 rpm. Output of the machine is 1500 shafts per 8 hours or about 10 feet of shaft per minute.

If your production problem involves finishing or cleaning of parts, an **O**sborn **B**rushing **A**nalysis most likely will demonstrate how this work can be done more efficiently . . . at less cost with new, improved power brushing techniques. Call or write Osborn for this service. There is no obligation.

Simplify
HEATING and COOLING
of Plating Solutions



One Unit
For Both

That's one big advantage of INDUSTRIAL'S Unit Heat Exchangers—you use the same unit for both heating and cooling. Maintaining the desired working temperature, by alternate heating and cooling in the one unit, simplifies controls and operation. The units are adaptable to either manual or automatic control.

INDUSTRIAL'S Unit Heat Exchangers are available complete with pump and stand, or tubes alone can be had for wall or ceiling mounting. A wide choice of capacity, too, is possible by using from one to six tubes in a unit. Special units are readily engineered to meet unusual capacity or space requirements.

★ *Write for recommendations*

Water Demineralizers . Filters

INDUSTRIAL FILTER & PUMP MFG. CO.

5904 Ogden Avenue, Chicago 50, Illinois

scale reading coincides with the sighting disk position. The liquid level of the buret is then accurately set to zero, the magnet turned on, the triangular armature of the cone support engaged with the magnet, and the buret tip brought into position over the center of the cone. The test is started by turning on the motor and dispensing the sample, consisting of 0.7 ml., onto the cone at a uniform rate while the cone makes one revolution. The start of the evaporation period is indicated by the contact of the first drop of sample with the cone, and the timer is started at that instant. The buret tip is than quickly swung back against the scale, the motor and magnet are turned off, and readings are made at periodic intervals. It was suggested that to obtain a detailed curve of the evaporation data, the time interval selected should give a reading for every 4 or 5 mm. rise of the cone or about every 5 per cent of the sample evaporated. The weight per cent of the sample evaporated at each reading is calculated by the following equation.

$$\text{Sample evaporated (weight \%)} = \frac{(R)\ (C)\ (100)}{(d_1)\ \ (0.7)}$$

R is the scale reading in centimeters at each reading. Designation of the other symbols has already been noted.

Evaporation Rate of Resin Solutions

The rate of evaporation of solvents from thin films of resins deposited on the cones in the instrument may be determined essentially as described above, except that special precautions must be observed to insure accurate sample delivery of the relatively viscous solution. An additional calculation must be made prior to starting the test. To make the evaporation data of the pure solvent comparable to that of the same solvent from a resin film, it is necessary to determine the volume of resin solution containing 0.7 ml. of solvent, as follows:

Specialists

in "SPECIAL" FINISHES for 50 YEARS

Customer confidence is our stock in trade and the mainstay of our business At KAY & ESS top management meets each customer personally and considers 'his' order of personal importance. We work hand in hand with our customers, bend over backwards for them and do the 'almost impossible' when the need arises. During our 50 years, over 40,000 individual formulae have been developed and hundreds of thousands of manufactured products have had more salability, more durability due to the fine quality of our Special Industrial Finishes. We welcome your inquiries write to

THE KAY & ESS CO.

KISER and LEO STS., DAYTON 4, OHIO

VARNISHES, JAPANS, LACQUERS and ENAMELS for INDUSTRIAL USES

$$\text{Resin solution sample (ml.)} = \frac{(d_2)\ (0.7)\ (100)}{(d_3)\ (100 - S)}$$

where d_2 is the density of the solvent in resin solution in grams per ml. at 77 deg. F.; d_3 is the density of the resin solution, in grams per ml. at 77 deg. F.; and S is the amount of solids in the resin solution, in weight per cent.

The total spring elongation due to the volume of resin solution equivalent to 0.7 ml. of solvent is calculated using the equation given below:

$$\text{Spring Elongation (cm.)} = \frac{(d_2)\ (0.7)\ (100)}{(C)\ (100 - S)}$$

In this equation, C is the spring constant in grams per cm. elongation.

An initial zero point is then set as described above, using the spring elongation as calculated above, and then because of the solids in the solution, a final zero point must be determined. The equation given below gives the spring elongation caused by the solvent in the sample and the final zero point to which the sighting disk returns when the volatile component of the solution has evaporated:

$$\text{Spring Elongation due to solvent (cm.)} = \frac{(d_2)\ (0.7)}{C}$$

The results of the test are calculated as previously outlined using the same density and sample volume (0.7 ml.) as used for the pure solvents.

One important feature of the new Evaporometer is the repeating interval timer shown with the instrument in Fig. 1. This timer consists of a small synchronous motor which through the proper gearing operates a second counter and a mechanism for providing two audible signals of distinctly different tone. The timer may be set to signal at 10 or 20-second intervals with a 3-second warning signal preceding the on-time signal. Thus it is possible to make rapid and accurate readings dur-

The *SIEFEN SYSTEM* of polishing and coloring is producing a dazzling finish on hollow, flat and stainless ware.

TRY A TRIAL ORDER!

J. J. Siefen CO.

5645 LAUDERDALE · DETROIT 9, MICH.
Nationwide buffing and polishing service

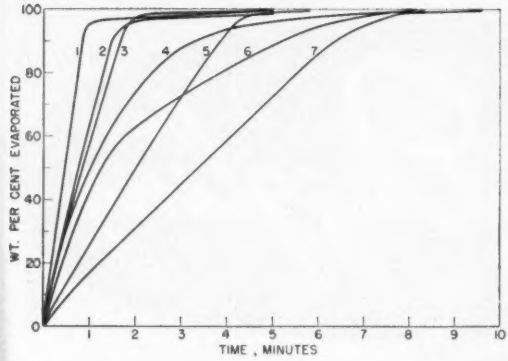


Fig. 3 — Evaporation rate data for lacquer solvents and thinners collected in the Shell Laboratories. Temperature, 77 deg. F.; relative humidity, 50 per cent.
(1) Low solvency lacquer diluent (Shell Benzo-Sol)
(2) Methyl ethyl ketone
(3) Medium solvent lacquer diluent (Shell Tolu-Sol)
(4) Lacquer formulation solvent mixture
(5) Methyl isobutyl ketone
(6) Methyl ethyl ketone-xylene (50-50 mixture)
(7) n-butyl acetate

ing an evaporation test without looking at the timer, and with the aid of the warning signal anticipate the reading and have sufficient time to locate the position of the indicator accurately on the scale.

Typical Evaporation Rates

Figure 3 shows the evaporation curves for several lacquer solvents and thinners.

In addition to determining rates of evaporation of thinners, as already pointed out, the new Evaporometer may be used for determining the relative solvent-release properties of film-forming materials, by measuring the rate of release of solvents from thin films of such materials deposited on the standard filter paper cones used in the instrument. Comparison of these data with the evaporation curve of the pure solvent gives an indication of how materials may perform when applied in a lacquer or other type of film. Data of this type as determined in the Shell Laboratory work are shown in Figure 4.

The deflection in the evaporation curves above approximately the 90 per cent evaporation point was found to be primarily due to the condensation of water on the cone from the surrounding atmosphere due to the cooling effect of the rapidly evaporating sample. The curves in Fig. 5 show the effect of humidity on evaporation rates. The Shell workers attributed practical

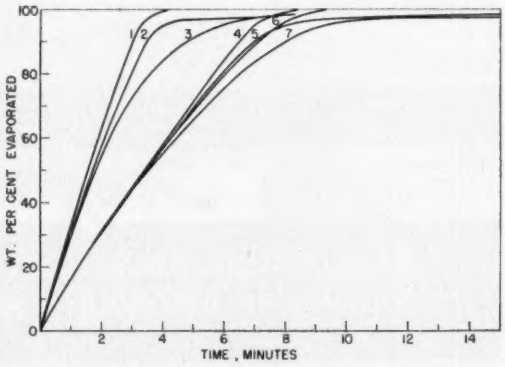


Fig. 4—Comparison of the evaporation curves of solvents with the evaporation curves of solvents from films of resins based on Shell Laboratories tests. Temperature, 77 deg. F.; relative humidity, 50 per cent.
(1) Toluene
(2) 10 per cent solution of Teglac Z-152 in toluene
(3) 10 per cent solution of paraffin wax in toluene
(4) n-butyl acetate (n-BuOAc)
(5) 20 per cent solution of Ester Gum C in n-BuOAc
(6) Xylene-n-BuOAc mixture (50-50)
(7) 20 per cent solution of Ester Gum C in Xylene-n-BuOAc (50-50 mixture)

NATIONAL'S "Mity-Midget"

FOR WORK OF ANY SIZE

Whether removing burrs on huge castings or putting a fine finish on relatively small surfaces, National's "Model 400" will do the job better and faster. Has a 3/16" orbital stroke . . . operates at 5000 to 6000 rpm . . . weighs only 4 lbs. . . . costs $79.50. Reliable . . . powerful . . . will not stall. Write for full details today or see your dealer.

MODEL 400

Fast...Light...Powerful!

NATIONAL AIR SANDER, INC.
2818 AUBURN ST., ROCKFORD, ILLINOIS

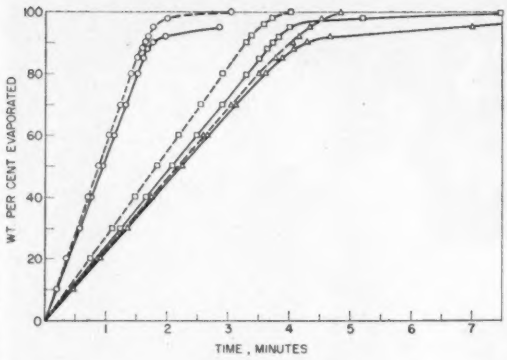


Fig. 5 — Shell Laboratories tests showing effect of humidity on evaporation rate of ethyl acetate, methyl isobutyl ketone, and isopropyl alcohol. Cone material, Whatman No. 4 Filter Paper.

——— 50 per cent relative humidity—77 deg. F.
— — — 1.5 per cent relative humidity—77 deg. F.
O ethyl acetate (85-88 per cent ester)
□ methyl isobutyl ketone
Δ isopropyl alcohol

significance to this phenomenon because it occasions the "moisture blush" of lacquers, yet escapes detection and measurement by bulk evaporation test methods.

Other Methods

A review of the literature on evaporation rate methods shows that the four principal types of instruments which have been used are bulk evaporation instruments employing metal cups or watch glasses and sample volumes ranging from about 7 drops to 25 ml. One of the simplest of these, which is described by H. A. Gardner and G. G. Sward in "Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors", is the Hart Evaporation Balance. This is a simple beam balance with a specially designed rider to facilitate reading directly in per cent, and a support for holding a watch glass from which the sample evaporates.

An evaporometer designed by Wetlaufer and Gregor is based on evaporation taking place from a closed graduated centrifuge tube. Preconditioned air is blown through the horizontally positioned tubes at a constant rate and readings are made by adjusting the tubes to a vertical position. (See also "Ind. Eng. Chem.", Anal. 7, 290, 1935.)

Another type of bulk evaporation instrument has been reported to be used in at least three modifications. It utilized shallow metal pans and sample volumes from 2 to 25 ml. Air circulation is provided by forced draft in the tunnel type instrument according to some designs. (See also "Ind. Eng. Chem.", 21, 592, 1929.) The so-called "Evap-O-Rotor" utilizes a method of rotating the samples on a turntable (See also "Ind. Eng. Chem.", Anal. Ed., 7, 278, 1935). A previous method developed in the Shell Laboratories is based on blowing intermittent blasts of air over the samples arranged in a circle. (See also "Ind. Eng Chem.," 28, 312, 1936.) The developers of the new Shell Evaporometer pointed out that few, if any, of these methods provide ratios of evaporation surface areas to volume of evaporating liquid which approach those that occur in the practical use of coatings.

* * *

Bright Nickel Has Advantages As An Undercoat for Brass and Gold

WHILE most finishing men are well acquainted with the bright nickel-chromium plate finishing operation, it has been brought out that bright nickel plate has advantages as a base for brass and gold in some finishing operations. At the 34th annual

How one Pittsburgh Brush*

POLISHES 10,000 HEATING UNITS

* *An actual case history from The Edwin L. Wiegand Company, producers of CHROMALOX Heating Units.*

WHEN this company needed a way to take the ragged edges off heating units economically and *fast*, they turned to rough, tough Pittsburgh Brushes for the answer. The 6″ Pittsburgh steel wire brushes like that shown above polish 10,000 heating units during their life.

LET PITTSBURGH ENGINEERS solve your brush problems. Pittsburgh's complete line of brushes of every type, for every purpose, will provide a practical, economical solution of any brush problem you might have. Drop us a line on your company letterhead for a copy of our new booklet that shows, through actual case histories, how Pittsburgh can help cut your brushing operation costs.

Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W6, 3221 Frederick Avenue, Baltimore 29, Md.

PITTSBURGH *Power Driven* **BRUSHES**

BRUSHES • PAINT • GLASS • CHEMICALS • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

convention of the American Electroplaters' Society, Stanley J. Beyer, Hart Manufacturing Company, listed some advantages in using bright nickel as an undercoat for brass. According to the report, the procedure may be used in finishing zinc base die castings, aluminum, lead or other soft metals, as well as for cast iron and steel. A copper-nickel-brass sequence can be used to advantage in many finishing operations.

Some of the specific advantages cited for the sequence as applied to finishing polished and buffed zinc base die castings were as follows:

1. The final finish is equal to or superior to that of the most highly buffed and colored brass.
2. The plating cycle can be completed in 15 minutes or less.
3. No final buffing of brass is required.
4. Being based on a copper-bright nickel-brass system similar to the conventional copper-bright nickel-chromium system, the process is readily adaptable to modern automatic and semi-automatic equipment.
5. The covering power of the brass solution over bright nickel is good.

The production line operation may be carried out in the usual manner to apply the copper-bright nickel plate. According to the procedure recommended by Beyer, following bright nickel plating, the parts are immediately covered with a 20 to 50-second flash of brass which supplies a bright yellow brass color to the parts. After rinsing and drying the parts are suitably lacquered.

One precaution pointed out was that the bright nickel plated parts should not be allowed to dry before brass plating; if so, the nickel may become passive and difficulty will be ex-

SAVE COSTLY SCRAPE DOWNS

Using expensive labor to scrape down spray-booths costs a lot more than peeling off accumulated overspray in big sheets. Safer, too.

Order a 5 gallon Test-Sample at Drum Lot price.

LIQUID ENVELOPE
PEELABLE
SPRAY-BOOTH COATING

DISTRIBUTED BY

General Spray Equipment Co., Boston, Mass. • Bay State Equipment Co., Springfield, Mass. • Lea Manufacturing Co., Waterbury, Conn. • Edgcomb Steel of New England, Milford, Conn. • Kellerman Paint Co., New York, N. Y. Grupek Paint Co., Newark, N. J. • Pennsylvania Lacquer Center, Philadelphia, Pa., • R. W. Renton Co., Cleveland, Ohio, Indianapolis, Ind. • Dean & Barry Co., Columbus, Ohio • Vic Miner Co., Toledo, Ohio • Abrasive & Supply Co., Detroit, Mich. • Molson Industrial Supply Corp., Grand Rapids, Mich. • O'Donohue Sales Co., Milwaukee, Wis. • Paints & Lacquers Inc., Chicago, Ill. • Tanner & Co., Indianapolis, Ind. • Metal Goods Corp., St. Louis, Mo., North Kansas City, Mo., Dallas, Texas, New Orleans, La. • Hubbard & Stau, Los Angeles, Calif • M. E. Smith Co., Los Angeles, Calif. • C & H Supply Co., Seattle, Wash. • Hugh Russel & Sons Ltd., Montreal & Toronto, Canada.

BETTER FINISHES AND COATINGS, INC.
268 Doremus Ave., Newark 5, N. J. • 122 East 7th St., Los Angeles 14, Calif.

to Page 66

FOR EXTRA METAL PROTECTION AND EXTRA PAINT DURABILITY ...USE ACP RUST PROOFING CHEMICALS AND PROCESSES.

For over 1/3 of a century, ACP has pioneered in the development, manufacture, sale and servicing of protective metal-working chemicals. These chemicals preserve the metal and the paint finish of both industrial and military products. Write or call for information about ACP Rust Proofing Chemicals and Processes and how they can improve your own products and production quality.

ACP Chemicals Meet Government Specifications

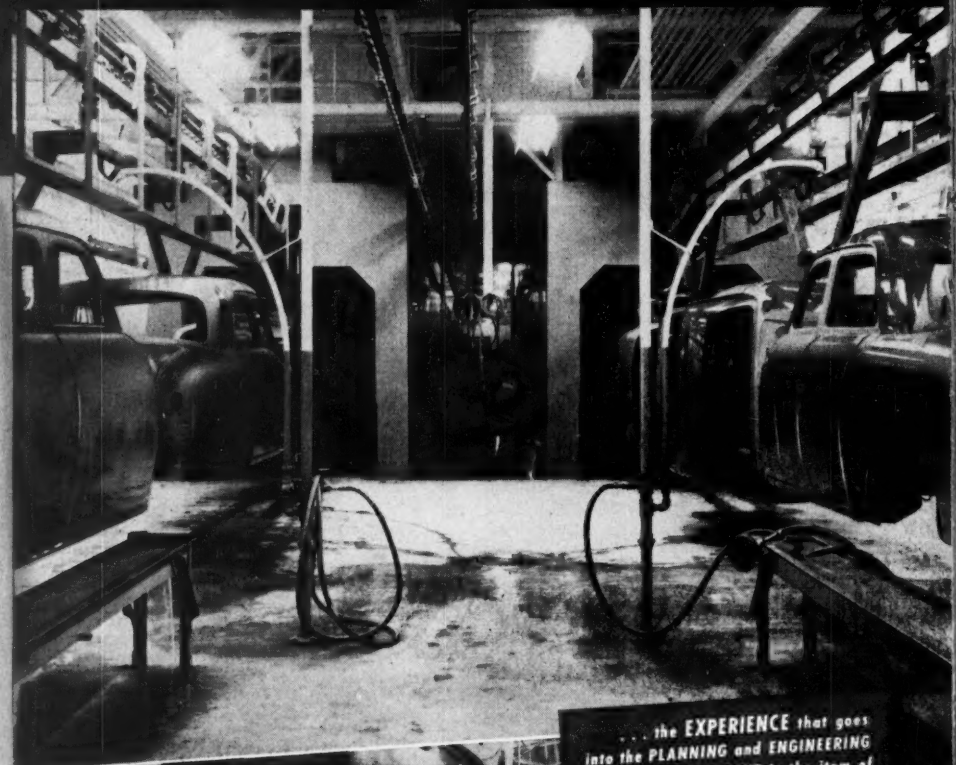
Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of METALLURGICAL, AGRICULTURAL and PHARMACEUTICAL CHEMICALS

COMPLET



. . . the **EXPERIENCE** that goes into the **PLANNING** and **ENGINEERING** of **MAHON EQUIPMENT** is the item of **GREATEST VALUE** to **YOU!**

Above illustration shows a section of the area where wet sanding operations are carried on in the two main production lines. Two Mahon Direct Gas-Fired, Tunnel-Type Drying Ovens which are equipped with Cooling Tunnels at the exit end are visible in the background. This is part of a complete, ultra-modern Mahon Finishing System specially designed for Automobile Bodies.

M

E

Finishing

SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

Bodies Emerging from two Mahon Hydro-Filter Spray Booths. Note Air Supply Above, and Baking Ovens at Right.

MODERN MAHON FINISHING EQUIPMENT Will Do A Better Job of Finishing For YOU Too!

Progressive manufacturers today insists on modern Mahon Finishing Equipment . . . they pay a little more for the many new features engineered into these systems to reduce maintenance, provide better working conditions, and produce finer finishes at lower cost. Illustrated here are some of the major units of equipment in a complete Mahon finishing system specially designed to process automobile bodies. This system comprises two complete finishing production lines and an additional two-tone and repair line . . . some of the innovations include an elaborate air supply and distribution system, "Hydraire" flood sheets for more efficient control of air flow within the down-draft spray booths, automatic sludge segregators and unloaders to eliminate the necessity for extensive periodic cleaning, cooling tunnels at exit ends of drying and baking ovens to conserve floor space and exhaust the excessive heat which the hot bodies would otherwise radiate within the plant. When you are in need of new finishing equipment, it will pay you to take advantage of the experience and the wealth of technical knowledge and practical know-how accumulated by Mahon engineers over a period of thirty years. See Mahon's Insert in Sweet's Mech. Ind. File, or write for Catalog A-650.

THE R. C. MAHON COMPANY

HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Dry-Off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens; Core Ovens, Hydro-Foam Dust Collectors, Fog-Filters, and other Units of Special Equipment.

AHON

perienced in the brass plating step. Should the brass deposit be off color, it may be flashed again, or nickel plated and flashed again after the solution has been corrected. An alternative is to remove the brass by treating the parts anodically for a few seconds in a cold cyanide stripping solution containing 12 oz./gal. sodium cyanide and 2 oz./gal. caustic soda. If the stripping is performed properly, the nickel will generally remain bright and satisfactory for a new brass plate.

In another finishing operation bright nickel is used as an undercoat for gold on brass parts to produce a decorative surface that will not scratch as easily as if the gold was plated directly on the brass. In a recent issue of "Metal Progress" (Feb. 1950), J. L. Bleiweis cites a case where a highly polished gold plated buckle is more resistant to scratching if the gold is "flashed" over a bright nickel undercoat than if it is deposited directly on the brass.

WANTED!

5,000 METAL FINISHERS

to try the improved DETROIT HANDY "TAC" RAG on all surfaces before applying varnish, lacquer or synthetic enamel. They're non-inflammable at no extra cost, ready for instant use, never dry out or harden. *Standard* of your Finishing Industry for 16 years. Ask your supplier today or send for sample.

DETROIT HANDY "TAC" RAG

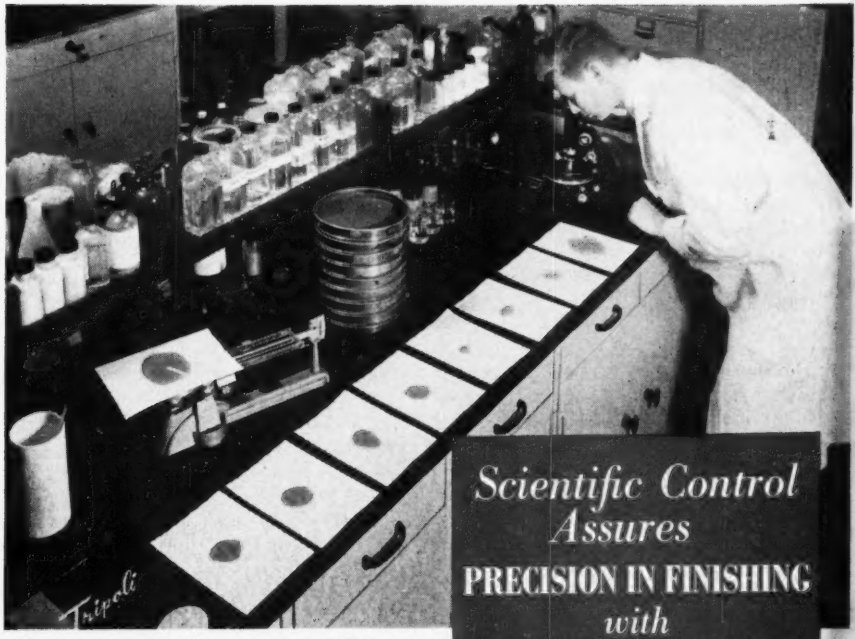
DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.

Black Finish With Light Absorbing Characteristics for Magnesium

A PROCESS developed by the Dow Chemical Company offers a method for producing a dense black finish on magnesium parts. The process, known as Dow Chemical Treatment No. 8, produces a durable black coating on both cast and wrought magnesium parts. The finish is said to have good light absorbing characteristics suitable for use on optical instruments. The treatment improves the resistance of magnesium surfaces to corrosion, and also gives a surface that is receptive to paints, should an additional decorative or protective finish be required. Dow reports that the coating produced by this process is somewhat superior to the Dichromate treatment in hardness of the coating.

Based on Dow's recommendations, Treatment No. 8 may be applied to all alloys and forms except Dow Metal M. Castings containing bearings, studs, or non-magnesium inserts of any nature may sometimes require this treatment, particularly when parts need refinishing. Brass, bronze, steel, and cadmium plate are reported to be unaffected by the treatment. Aluminum is rapidly attacked during the hydrofluoric acid treatment step.

The black finish is obtained by a series of three treating steps. The first step serves to remove oxide and brighten the surface of the metal. It utilizes a "bright pickle" solution. If a dull black with maximum light absorbing qualities is desired, a very light blasting should be substituted for the "bright pickle." The "bright pickle" may sometimes be inadequate to remove swirls or other surface imperfections in die castings in which case it is recommended that mechanical buffing or wire brushing be substituted for the "bright pickle." After any of



Scientific Control Assures
PRECISION IN FINISHING
with

Stevens Compositions

Metal finishers have found that Stevens has the composition they can depend on for constant quality and maximum polishing and buffing efficiency. That is because for more than half-a-century Stevens research and production facilities have been devoted to creating better compositions for precision operations. Every conceivable measure is taken to provide the finest in buffing and polishing compositions for Stevens customers—for every finish, every metal.

For example, raw materials—such as abrasives and binders—are subjected to a careful analysis in Stevens' modern, well-equipped laboratory before they are accepted for use in Stevens compositions.

This scientific control is carried through the entire operation of composition manufacture at Stevens—from mixing to moulding to cooling to packing. Let your nearby Stevens representative acquaint you with the many types of compositions Stevens has developed to meet every requirement. Call him today or write to Frederic B. Stevens, Inc., Detroit 16.

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. **STEVENS** INCORPORATED

DETROIT 16, MICHIGAN

these mechanical methods are used, the part is then ready for step two, which consists of a hydrofluoric acid pickle. Magnesium parts must have surfaces free from oil and grease prior to application of the chemical treatment. The "bright pickle" step requires that magnesium die castings be immersed for 30 seconds to 2 minutes in a solution of the following composition operated at room temperature:

Chromic acid (Conc.)	37½ oz./gal.
Nitric acid	3¼ fl. oz./gal.
Hydrofluoric acid (48-52 per cent HF)	1 fl. oz./gal.

Cast or wrought parts may use the above solution but it is reported that the same effect can be obtained at lower operating cost by the use of a 30 second to two minute dip at room temperature in the following alternative solution:

Chromic acid	1½ lb./gal.
Sodium nitrate	4 oz./gal.
Magnesium fluoride	⅓ oz./gal.

Following the treatment, parts are rinsed immediately in a cold water bath containing 5 per cent sodium metasilicate (6½ oz./gal.) and further rinsed in cold and hot water.

After the "bright pickle" treatment, parts are given the "HF pickle" treatment by immersing for 5 minutes in a solution containing 15 to 20 per cent by weight of hydrofluoric acid (HF) at room temperature. A satisfactory bath can be prepared by diluting one volume of technical grade 48-52 per cent hydrofluoric acid with two volumes of water. Following this, parts are washed thoroughly in cold running water. In handling hydrofluoric acid, great care must be taken to avoid contact with the skin.

After the above treatments, a uniform black coating is obtained on the parts by treating for 30 to 40 minutes in the following solution maintained at the boiling point (210-212 deg. F.):

to Page 72

STOP RUST AND CORROSION with

PHOSCOTE

- A new type phosphating cleaner that cleans and phosphates in a single operation.
- Prevents under film rust and corrosion, adds life to the finished item.
- Produces a fine, evenly dispersed phosphate coating on the metal surface for greater paint adherence.
- Is a non-toxic, non-corrosive powder, does not sludge out in the operating tank.
- Phoscote is economical to use on both steel and aluminum due to low using concentration and ease of application.

Further information supplied upon request.

PELRON CORPORATION

(Formerly Chemco Products Co., Inc.)

7740 WEST 47TH STREET **LYONS, ILLINOIS**

JENSEN FINISHING SYSTEMS ARE *ECONOMY ENGINEERED* TO CUT EVERY COST CORNER

JENSEN ECONOMY ENGINEERING INCREASED PRODUCTION 100%

in this flexible "L" shaped unit. 1½ to 2 min. baking time at conveyor speed of 22½ ft. per. min., permits finishing 2700 pcs. per hr. Revolving spindles on 6" centers, rotate parts 10 times in single pass through automatic spray of synthetic black lacquer—are driven by separate drive unit apart from conveyor.

Manufacturing breather caps for oil filler pipes was nothing new for this manufacturer—he'd been doing it for years—had even rigged up an infrared oven of sorts which did a "good enough" job of baking a final finish. That was before production demands doubled, finish specifications became more critical and sizes began varying.

The only available space for more finishing facilities was a corner going around other equipment. Jensen engineering ingenuity gained through years of radiant heating and conveying experience answered the problem with this completely mechanized, *coordinated* Jensen Finishing System . . . *economy engineered* to cut every cost corner.

YOU TOO, CAN CUT COST CORNERS *and profit by having Jensen plan and construct your finishing system. You get space-saving lay-out, efficient conveying coordinated with proper radiant heating equipment . . . better, faster finishing at less cost!*

Jensen SPECIALTIES INCORPORATED

●Representatives in Principal Cities

9331 FREELAND AVENUE • DETROIT 28, MICHIGAN

MANUFACTURERS OF *ECONOMY-ENGINEERED* RADIANT HEAT EQUIPMENT

"DUAL HEAT" INFRARED OVENS • CONVEYORS • PAINT DIP TANKS

Try this ONE-COAT, Two-Purpose, Three-Dimension Finish for those Hard-To-Dress-Up Products . . .

the New

DIMENSO® ONE-COAT METALLIC

Here's a rich, lustrous answer, in a single package, to a wide range of finishing problems! Dimenso One-Coat provides a dual-purpose, finish that goes on in a *single* coat without need for special spray equipment.

It gives beautiful, varied, hammered effects for large, uninteresting surfaces—or, by modifying the method of application, a variety of rich opalescent effects. It can cut metal-finishing costs in many cases by eliminating priming operations . . . covers minor metal surface defects in one coat without expensive surface preparations.

Dimenso One-Coat air-dries out of dust in ten minutes. It *bakes* in 3 to 5 minutes at 350° F. It provides a *tough, mar-resisting* film that withstands severe service, with excellent *heat resistance.* For complete details, ask your Sherwin-Williams Branch for Bulletin D-506 . . . or write to The Sherwin-Williams Co., Industrial Division, Cleveland 1, Ohio.

TWO FINISHES IN A SINGLE CAN
Sprayed on smooth metal, Dimenso One-Coat gives a unique hammer pattern. When surfaces are not completely smooth, apply a full wet coat, followed by a light mist coat, and you get a rich, opalescent effect.

NEEDS NO SPECIAL EQUIPMENT
—Dimenso One-Coat is applied with regular spray equipment and no special skill is needed.

HIDES SURFACE DEFECTS WITH ONE COAT—Slight imperfections in metal surfaces are completely hidden by a single coat of this new S-W Brown Label Finish.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

CIVILIAN PRODUCTION

DEFENSE ORDERS

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

KEMCLAD
•
SUPERCLAD
•
KEMVAR
•
TV LACQUERS
•
HEETCLAD
•
KEMWOOD PRODUCTS
•
DIMENSO

Another Product of SHERWIN-WILLIAMS INDUSTRIAL RESEARCH
COVER THE EARTH

the same dependable source for

• FINISHING MATERIALS
• FINISHING KNOW-HOW

Whether you are buying finishes to meet defense specifications or your own civilian requirements, you can simplify the job . . . find dependable help on special needs . . . eliminate troublesome problems . . . through The Sherwin-Williams Industrial Division with its wealth of know-how and background, both in civilian and wartime experience.

This broad background provides the same extra advantage of experience in Sherwin-Williams finishes supplied to meet military specifications—whether for wood, metal or other surfaces—as in the S-W finishes well known for many years for civilian production, such as Kemclad, Superclad, Kemvar and TV Lacquers. This experience is available wherever you may be, through facilities extending from coast to coast. Call, wire or write The Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

Ammonium sulfate	4	oz./gal.
Sodium dichromate	4	oz./gal.
Ammonium hydroxide	⅓	fl. oz./gal.
Nigrosine black W.S. dye (color index No. 865)		
or		
Indulin bluish W.S. (color index No. 861)	¼	oz./gal.

pH 5.6 -6.0

Properly applied coatings will be a solid black. Methods for control of the various solutions used have been worked out by the Dow Chemical Company.

* * *

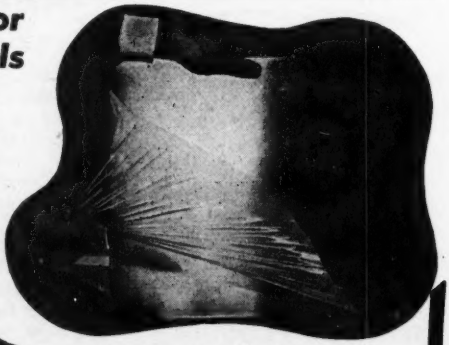
Mechanism of Formation of Electroplated Brass

A COMBINATION of electrochemical and X-ray technique was applied by T. Banerjee and A. J. Allmand in a study of the mechanism and structure of brass deposits from cyanide solutions which was conducted at Kings College, University of London (England), and reported in the "Transactions of the Faraday Society." The research workers reported that the heterogeneity of electrolytic brass deposited at a constant current density is primarily due to changes in cathode potential during electrolysis. Experiments were conducted which showed that the composition of brass, deposited from an electrolyte of which the concentration remains essentially unchanged during the period of electrolysis, is determined by the cathode potential employed, and if the latter is kept constant, remains unaffected by the duration of electrolysis.

Working at room temperature, with intensive circulation of the electrolyte, with a total (Cu + Zn) concentration of 0.50 g.-atom/l. and with hydroxide and cyanide concentrations substantially the same in every case, it was reported that brass of any required composition can be deposited by suitable variation of (a) Cu/Zn

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.



THE STRIPLASTIC COMPANY

Among many advantages, it is nontoxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

10828 QUEBEC AVE.
CLEVELAND 6, OHIO

HOT Lacquer NEWS

PUBLISHED PERIODICALLY BY HERCULES POWDER COMPANY IN THE INTERESTS OF BETTER FINISHES AND FINISHING

Angelus Furniture Mfg. Co. Says... "Hot Lacquer Beats Any Other Finish"

Hot Lacquer Gives Angelus Furniture Finishes More "Build" With Fewer Gun Passes

From a 10-acre Los Angeles plant, Angelus Furniture Manufacturing Company is bringing into countless homes Early American Traditional Masterpieces through modern mass production methods. Only recently, this company further stepped up its mass production efficiency, made the quality of its finishes even better—by changing to the hot-spray lacquer process.

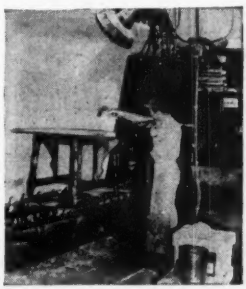
Mr. Henry Grieninger, Supervisor of Finishing Operations for Angelus, is enthusiastic over his company's changeover to the hot-spray lacquer process. Comparing hot lacquer with the regular cold lacquers which Angelus used for many years, and with low-bake synthetic finishes which were also tested, he says, "The most important reason why we go for hot lacquer here is that one coat equals one-and-a-half or even two coats of ordinary lacquer. The high solids in hot lacquer do not penetrate as far into the wood as does cold lacquer during the cooling out process. Consequently, hot lacquer films have an extra 'build' on the surface. This superior surface gives us a better sheen, cuts down the cost of rubbing in some cases as much as 50%. Hot lacquer lays on nicely with much less overspray, and much better coverage. Hot lacquer retains all the advantages of easy 'touch-up' characteristic of cold lacquer and introduces no repair difficulties. We are saving all along the line in finishing material, thinner, operating overhead; and getting fewer rejects, better quality finishes."

Hot lacquer finishes have all cold lacquer's unique combination of properties including fast-dry, ease of sanding and polishing, print resistance, and variety of finishing choices. In addition, Angelus found that its glossy hot lacquer films are much more impervious to cold checking and cracking.

Free Booklets on Hot Lacquer

Hercules offers detailed information on hot lacquer, the types of heating equipment available, and the performance record of hot lacquer in many industries. There is also promotional material that can be used by lacquer manufacturers. Write for copies of current literature.

HERCULES POWDER COMPANY
INCORPORATED
927 Market Street, Wilmington, Delaware



Workman gives a table the gun with hot lacquer.

Front view of main building of Angelus Furniture Manufacturing Company, Los Angeles, California. One of the largest and most complete plants of its kind in the west, the company occupies an operating floor space area of 350,000 square feet.

CL51-2

ratio in the electrolyte and (b) cathode potential. Such deposits contain either one pure phase or a mixture of two adjacent phases.

In discussing the results from their research, Banerjee and Allmand postulated that the first stage in the formation of electrolytic brasses, whatever their composition, from the primary amorphous deposit of zinc and copper atoms laid down by the current, is the appearance of a primary solution, that is, of either a modified copper or a modified zinc lattice, depending on the conditions at the cathode during electrodeposition. It was pointed out that these phases, if they contain less than 66.9 or more than 75.0 per cent copper respectively, will be metastable, and the more so, the more they transgress these stability limits. They will therefore tend to transform spontaneously to more stable, and finally, to the most stable form, following the law of successive states. These transitions should be facilitated by the disappearance of the primary co-deposited hydrogen atoms as gaseous hydrogen, thus leaving vacant gaps in the rudimentary lattice. Further, it was pointed out, that it is probable that a change from one pure phase to another of the same composition will take place more readily than the separation of a single phase into two congruent phases of different compositions.

Nickel was the fourteenth metal to be recognized and the seventeenth element to be discovered. It was isolated and named by Cronstedt, a Swedish scientist, in 1751, 200 years ago.

According to records supplied by service stations, 60 per cent of automotive engine wear can be attributed to corrosion. The postwar trend in the industry of electroplating cylinder liners, pistons, rings and other engine parts with porous chromium and tin is reducing wear from corrosion and abrasion more than 30 per cent, according to a report recently received by the American Electroplaters' Society.

FORM-A-ROC
FIRST-COAT
FOUNDATION
FOR FINE FINISH

1. Dries with lacquer speed.
2. Has double lacquer solids at spray gun.
3. Fills very well—sands easily.
4. Adheres tenaciously to steel, wood, presdwood, aluminum, galvanized metal, etc.
5. Holds out lacquer, synthetic or oleoresinous enamels exceptionally well.
6. Thins 3:1 with xylol.
7. Available in GREY, SALMON and OFF-WHITE.
8. Ground well to smooth texture.

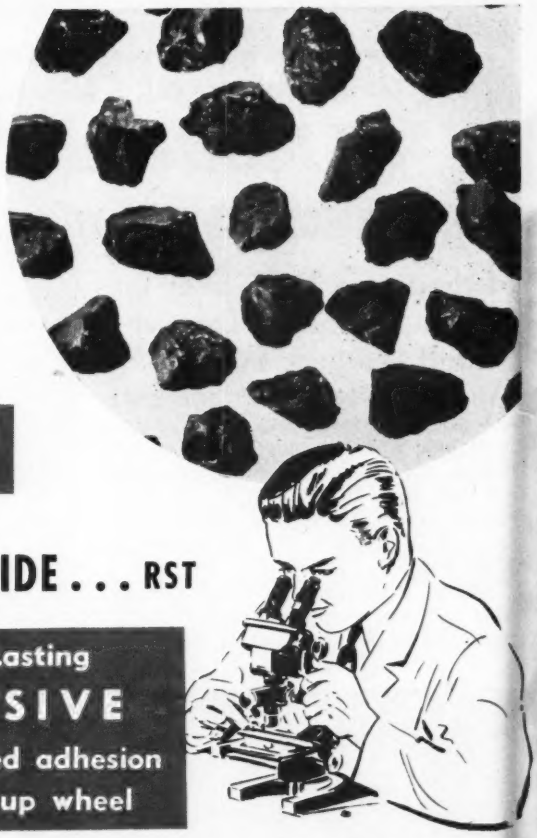
MADE BY
The Varnish Products Company
5208 Harvard Avenue Cleveland, Ohio

For further information on any product mentioned in this issue —use the READER SERVICE CARD between the covers.

METAL FINISHING SUCCESS goes back to

EXOLON

ALUMINUM OXIDE . . . RST



Tough, Lasting
ABRASIVE
with increased adhesion for the set-up wheel

Photomicrograph of EXOLON RST Polishing Grains.

● EXOLON RST is aluminum oxide fused in an electric arc furnace to form a hard, enduring abrasive. It is crushed, carefully graded, run through powerful magnetic separators, and ceramically coated to increase adhesion to set-up wheels. These chunky grains of RST assure efficiency and economy in all types of metal finishing.

Write for Literature on EXOLON Abrasives Today.

THE EXOLON COMPANY
943 East Niagara St. Tonawanda, New York

Manufacturers of SILICON CARBIDE *and* ALUMINUM OXIDE ABRASIVES

PRACTICAL APPLICATIONS *of Modern Products*

Methods and Equipment for Steam Spraying of Lacquer and Synthetic Finishes

A COMPLETE line of equipment for spraying paint with steam, including a spray gun using superheated steam instead of compressed air, has been introduced by the Kellogg Division of American Brake Shoe Co., 97 Humboldt St., Rochester 9, New York.

Steam spraying is a revolutionary new process developed and recently patented by E I. du Pont de Nemours. The use of dry, super-heated steam as an atomizing medium serves to heat the finishing material, making it possible to use materials of higher viscosity. This facilitates the application of heavier coats without sagging or running. The difficulties of pinholing and popping, normally caused by entrapped air, are reduced.

Because of the characteristics of steam, finishing material savings of 10 to 20 per cent can be expected in most applications through the reduction of overspray and atomization losses. In addition, savings in solvents and thinners are realized through the use of finishing materials higher in solids.

In many cases the material thickness per coat can be substantially increased by steam applications. This, plus fewer cleanings of the spray booth because of reduced overspray, can lead to substantial labor savings.

The steam spray process is now being used by large manufacturers with finishing assembly lines, and others are currently experimenting with the process. The greatest advantages of this new method

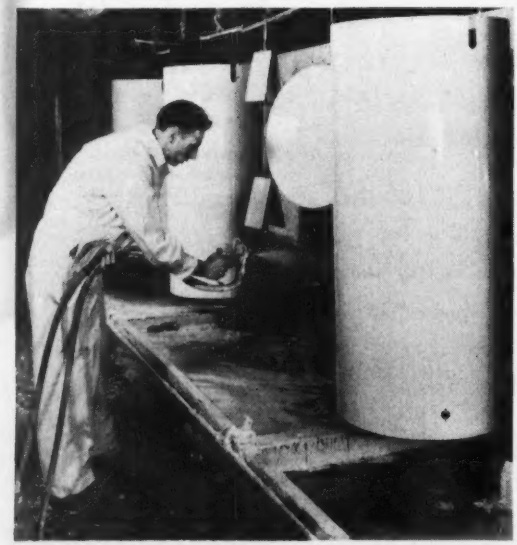


Fig. 1—View of operator using steam spray gun and equipment to paint water heater tank on assembly line of large appliance manufacturer.

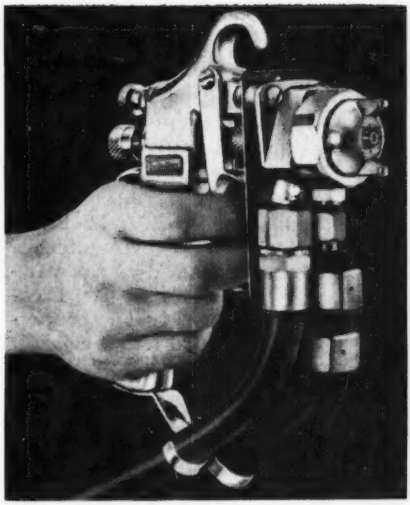


Fig. 2—Steam spray gun developed by Kellogg Division of American Brake Shoe Company.

are realized in continuous, high volume finishing operations.

A source of steam of not less than 100 p.s.i. is required for operation. If plant steam is unavailable, this may be furnished by a small steam generator. Appropriate steam spray guns, separators, strainers, traps and regulators are needed, as well as a superheater to dry the steam by raising it to the proper temperature.

The S-100 steam spray gun, shown in the accompanying photos, was developed by Kellogg to meet the unusual requirements of steam spraying. New insulation and radiation design features dissipate the heat caused by the steam in the gun, enabling the operator to use the gun continuously in comfort with bare hands. Hose supports for steam and materials reduce the downward torque on the spray head, making it more easily balanced and less tiring for the operator. Other features include a built-in finger guard, and adjustable fluid needle, and a spray head with a one-piece, easy-to-clean steam cap, and fluid nozzle.

New Brushing Method Produces Attractive Surface Finish on Golf Club Shafts

A 20 PER CENT increase in production, plus a uniform surface finish prior to plating, are now being obtained by a large Midwest sporting goods manufacturer through the utilization of a new Osborn brushing method.

A five-station machine using Fascut brushes manufactured by The Osborn Manufacturing Co., 5401 Hamilton

Fig. 1 — View of the five-station brushing machine used to remove heat-treat discoloration and surface imperfections from tapered "step-down" golf club shafts.

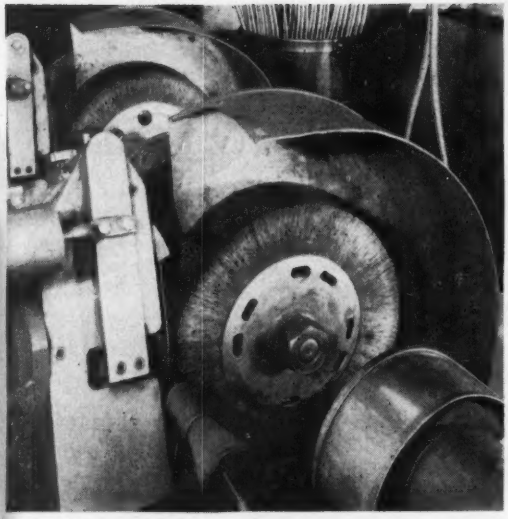


Fig. 2—Close-up view showing how golf club shafts are fed mechanically past the Osborn Fascut brushes.

Ave., Dept. 392, Cleveland, Ohio, is solving the problem of removing heat-treat discoloration and surface imperfections on tapered golf club shafts.

Due to the tapered "step-down" design of the cold-drawn, heat-treated, high carbon alloy, seamless steel shaft, it was a problem to get into the "step-down" corners. With the former method, two or three passes were necessary to do the job. With the brush method only one pass is required to turn out a better finish at a rate of over 1500 shafts per eight-hour shift, or 10 feet of shaft per minute.

The shaft is hand fed into the first station. A power infeed keeps it moving until it passes the last brush. The first station breaks the discoloration; brushes are used to prevent bridging the "step-down" corner.

Tin Recovery with Hydrogen Peroxide

Non-ferrous scrap such as recovered from electrical equipment, and so on, usually contains considerable quantities of copper together with tin, lead, zinc, and other metals. It is, of course, desirable to effect a clean separation of the various metals for re-use. Electrolytic refining is the preferred method and is usually carried out as a multi-stage process, in which individual metals or groups of metals are plated out step-wise, with the residual metals going into the slimes or remaining in solution. It may be desired to cause the tin, present in the electrolyte, to remain in solution as stannous salt or to precipitate out as oxide (metastannic acid). This can be accomplished by adding hydrogen peroxide to the electrolyte. Depending on the amount of hydrogen peroxide added, anodically dissolved tin may be caused to divide itself in almost any desired ratio between tin remaining dissolved in the bath and tin precipitated as anodic slimes. If practically complete precipitation of tin is desired, a slight excess over the stoichiometrically needed amount of hydrogen peroxide is added to the bath. Reduction of this amount will then reduce the proportion of tin precipitating and will leave a corresponding amount of tin in solution.

—(U. S. Patent 2,286,240, J. R. Stack)

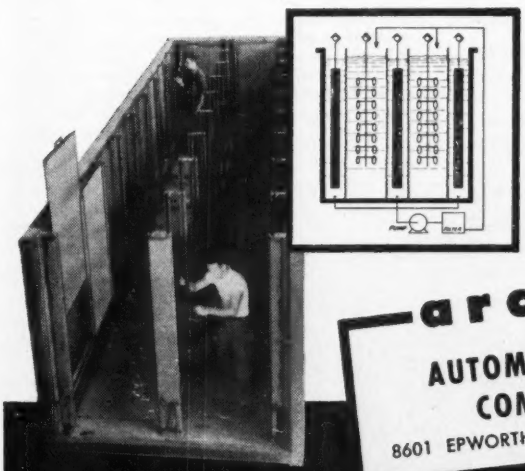
For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

SLIPPAGE!

Every day it becomes more important that plating rejects be brought under control

DIAPHRAM PLATING ASSURES A NEAR PERFECT FINISH—CONSERVES METAL AND REDUCES COSTS

Diaphragm systems now in operation have reduced plating costs and minimized loss of hard-to-get materials due to slippage through rejects . . . Diaphragming permits the segregation of anolyte and catholyte to remove by filtering, organic and metallic insoluables that normally deposit themselves on the work piece causing roughness and corrosion areas in the plate.



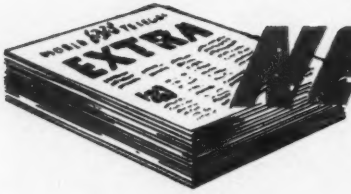
Our engineers have worked closely with the leading plating engineers who have made Diaphragming practical. We are glad to offer you the benefit of our speicialzed knowledge and experience in this field in planning a new installation or determining the feasibility of converting your existing equipment.

Write for our Literature on Diaphragming

arco

AUTOMOTIVE RUBBER COMPANY, INC.

8601 EPWORTH BLVD. • DETROIT 4, MICH.



NEWS of the Industry

NEW PLANTS

The **O'DONOHUE SALES COMPANY** of Milwaukee, Wisconsin, distributor of industrial finishing supplies, announces the removal of its general offices and laboratory to larger quarters at 2325-28 West State Street, Milwaukee. Warehouse locations of the firm remain unchanged.

On the eve of its sixty-third year of manufacturing spray equipment, **THE DeVILBISS CO.**, Toledo, Ohio, announces the completion of a modern building for all customer service facilities. Not only will the structure provide quarters for the spray finishing school, but it will also afford ample space for display and demonstration space, plus a complete customer research division to which may be submitted problems on all phases of spray finishing and spray equipment installations.

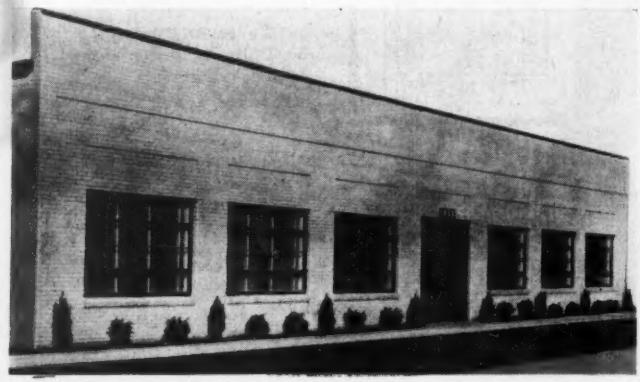
The new school and research building is now open to visitors at the main plant in Toledo.

COMPANIES

According to an announcement by Paul E. Pelletier, president, the name of **CHEMCO PRODUCTS COMPANY, INC.**, has been changed to **PELRON CORPORATION.** Management, personnel, and location (Lyons, Illinois) will remain the same.

Pelron Corporation manufactures industrial chemicals, metal cutting and grinding compounds, metal drawing compounds, metal cleaners, paint strippers, and metal phosphating compounds.

Approximately three years ago Charles W. Yerger bought out the Lupomatic Tumbling Machine Company, assumed the presidency, and changed the name of the company to Lupomatic Industries, Inc. At the same time a completely new policy was adopted, with the objective being the development of new types of tumbling equipment, compounds, and processes. In addition, manufacturing, operating, and management policies were completely revised. Shortly after this was accomplished, the trade name Tumb-L-Matic was adopted for the improved products and processes. It has now been decided, in order to ensure the



New plant of Detroit Surfacing Machine Company, manufacturer of the Model DF Detroit EASY Finisher, located at 1333 East Eight Mile Road, Detroit 20, Michigan.

ANNOUNCING A RADICALLY NEW TYPE OF CHROMATE FINISH FOR ZINC AND CADMIUM

IRIDITE® #8P

1. NEW LOW MATERIAL COSTS!

Each gallon of working solution you mix costs from as little as 35¢ down to only 8¼ ¢, depending upon solution concentration and appearance desired. In addition, you get an extra 10% discount on material orders for 2000 pounds or more!

2. NEW LOW SHIPPING COSTS!

Iridite #8P is shipped to you as a *dry powder* in disposable steel pails. No liquids! No carboys! Saves up to 75% in freight; travels via low Third Class Rates. Pails take less storage space, reduce handling time and costs.

3. NEW BRIGHT OR GOLDEN FINISH!

A sparkling blue-bright finish results when you use Iridite #8P followed by a simple caustic soda bleach. Or, the coating can be produced as a golden-yellow iridescent film from a single dip by simply decreasing the concentration.

4. NEW ALL-PURPOSE USE!

New Iridite #8P can be applied by a simple chemical dip to any zinc or cadmium surface . . . plated, diecast, galvanized or sheet. Mixing is easy since the powder dissolves readily into solution. No special equipment or specially trained personnel is needed. Corrosion resistance is determined by the appearance desired; the choice is up to you. But for any appearance you are assured of maximum Iridite quality in corrosion resistant and paint base characteristics.

WRITE FOR FREE TEST SAMPLE or send samples of your product for finishing with new Iridite #8P. See for yourself how this amazing new Iridite treatment can cut your finishing costs.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

continuance of the policies introduced by Mr. Yerger, to capitalize on the success of the Tumb-L-Matic processes, equipment and supplies, and to avoid confusion with the previous company, to give the reorganized company the Tumb-L-Matic name. The company will now be known as **TUMB-L-MATIC, INC.**, and continues to be located at 4510 Bullard Ave., New York 70, New York.

W. P. FULLER, III, treasurer, W. P. Fuller & Company, San Francisco, has been elected first vice president of the San Francisco Chamber of Commerce.

Mr. Fuller, who has served as a director of the Chamber for the past year, has been associated with the well-known paint company, founded by his grandfather, since 1937, when he graduated from Harvard Law School. He started at the Fuller South San Francisco factory, spent a year in various departments of the firm in San Francisco, and was finally assigned to the glass department and asked to assist with labor relations.

Following service in the U. S. Navy, in 1946 he was appointed manager of Fuller's glass division and placed in charge of company labor relations. He was elected to the company's board of directors in January 1949, and in January 1950 became treasurer of the firm.

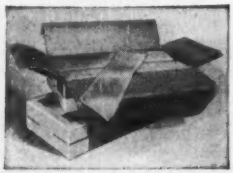
The Belke sales office in Detroit has been moved to larger quarters in a new, modern building at 10700 Puritan Avenue, according to an announcement by the **BELKE MANUFACTURING COMPANY,** Chicago.

CHARLES W. JINNETTE, Norton Company's regional manager of business planning and development, retired December 31, 1950, after 50 years and six months' active service with the company.

Widely known throughout the industrial centers of the nation's Midwest, where he spent all his working years, Mr. Jinnette first started in the Worcester grinding wheel company's Chicago office in June of 1900 at the age of fourteen.

During his long career, Mr. Jinnette assisted in the development of several abrasive manufacturing techniques, plus the commercial promotion of Norton Company's Norbide boron carbide abrasive

IN ROLLS
Cut off any size piece and use as needed.



CUT BULK
Already cut and folded, ready to use.

NOW! Tack Cloth in Handy Rolls or Cut Bulk

Now you can get Tack Cloth packed the way it's easiest for you to use—either in 150 yard rolls of 36" wide cloth or in handy cartons—100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will *stay* SOFT and TACKY until the very last bit is used up.

The Cut Bulk size is 18" x 36"—folded to 4½" x 18" for easy handling. *All of our Tack Cloth is Spontaneous Combustion-Proof, Lint-Free and Wax-Free.* It's clean and sanitary—*there's no waste.*

Write today for complete information, prices and samples.

BAUGHN CHEMICAL PRODUCTS CO.

The Tacky Wiper Specialists

7019 N. Ravenswood **Chicago 26, Ill.**

Also Individually Packed in Glassine Envelopes—144 to the Carton

— A WARRANTY OF SATISFACTION IN EVERY CARTON —

you save 50% in TANK HEATING and COOLING with PLATECOIL

(REPLACE PIPE COILS)

★ You SAVE 50% in tank SPACE
★ You SAVE up to 50% in initial COST
★ You have 50% LESS WEIGHT to handle
★ You SAVE 50% in maintenance LABOR as plates are changed from outside the tank without dumping solution

. . . besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P50.

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

Why Platecoils Cost Less

LOW FIRST COST

The initial cost of Platecoil is often 50% or more below the cost of equivalent pipe coil depending, of course, on the materials used in construction.

EASY INSTALLATION

By the use of "quick change hangers" Platecoil installations can be made in open tanks in one-half hour or less by one man and a helper.

NO THREADED JOINTS IN TANK

The entire Platecoil is electric welded and pressure tested. There are no joints to corrode or leak. Both connections to the Platecoil can be located above the liquid level where there is no danger of thread corroding and freezing.

GREATER TANK CAPACITY

A 22" x 47" Platecoil gives the same heat transfer surface as 32 feet of 1½" pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil.

WEIGHS 50% LESS

Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install Pipecoil.

TANK MAINTENANCE WITHOUT LOSS OF SOLUTION

There is no need for workmen to get inside the tank in order to make replacements or repairs. A Platecoil can be removed in a matter of minutes with the solution still in the tank.

LITERATURE

The new Platecoil Bulletin furnishes a complete description of the Platecoil method of tank heating. Write for your copy today.

HIGH BTU TRANSFER

More prime surface of Platecoil can be installed in a given area than can be obtained with pipe coil. Thus a more compact Platecoil unit provides much greater BTU transfer per unit area than can be obtained with pipe coil. Quick starts in heating tank solutions mean more hours of productive time.

Kold-Hold Manufacturing Company, Lansing 4, Michigan

and molded products, Norton ceramic surface plates, and the development of ceramic wear-resistant materials.

NEW POSITIONS

The addition of **J. O. HUSTING** to the sales and technical staff has been announced by C. F. O'Donohue, president of O'Donohue Sales Co., Milwaukee, Wisconsin.

Mr. Husting, a graduate of Marquette University School of Chemical Engineering, was plant engineer of the Ogden, Utah plant of Solar Corporation prior to joining the company.

HOWARD H. BLOUCH has been appointed sales manager of the Cleveland plant of the Chromium Corporation of America. He succeeds Charles McKinley who died in October.

Mr. Blouch has had wide experience in the plating industry; twenty years with the Electroplating Division of E. I. du Pont de Nemours & Company, two years as process engineer with the Van der Horst Corporation, and the last four years as Western sales manager of the Heil Process Equipment Corporation.

The Buckeye Products Co., Cincinnati, Ohio, manufacturer of Speedie Buffing and Polishing Compositions and distributor of a complete line of polishing room accessories, has announced the appointment of **E. G. GOSS,** Elba Road, Grosse Ile, Michigan, as representative in Detroit, Toledo, and surrounding territory.

E. G. Goss

Mr. Goss has had extensive experience and training in the metal finishing field, and is well acquainted in Detroit as the result of some 14 years devoted to sales engineering in this area.

The Carborundum Co., Niagara Falls, N. Y., has established a Marketing Department under the direction of **FREDERICK T. KEELER,** according to an announcement by Fred W. Bonacker, general sales manager of the company.

The department brings together all related staff functions of marketing, including market research, advertising, sales promotion, and public relations. A staff organization of the Sales Division, the Marketing Department will service all domestic and Canadian marketing operations of the company.

Mr. Keeler, graduate of Hamilton College and Harvard Graduate School of Business Administration, who has been with the company since 1943, was director of Commercial Research prior to his appointment as director of marketing.

ARTHUR BATTS, JR., formerly assistant director of Commercial Research, will be manager of that department, and handle market research and sales forecasting. A graduate of Hamilton College and Harvard Graduate School of Business Administration, he started with Carborundum in 1936.

ARTHUR W. COWLES, advertising manager, formerly in the advertising and

HOLLAND SAYS:
DEBURRING WILL CUT GRINDING COSTS
Motor Driven Tilting Tumbling Barrels for cleaning, polishing, grinding, deburring, sanding, burnishing and various other applications.
Wide selection of metal finishing equipment on hand. Write for FREE folder "M."
J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N.Y.

Compelling

Distinctive finishes . . . skillfully prepared in our Creative Studio . . . have compelling qualities, too! They are eye-catching, sales-motivating coatings which subtly enhance the fine lines and design of any product. Our talented artists . . . men who know the value of individuality . . . have the background and experience so necessary in developing such finishes. Why not avail yourself of their creative abilities?

No Tampering with Quality

ROCKFORD VARNISH Company
ROCKFORD, ILLINOIS
Manufacturers of Protective and Decorative Coatings

Affiliate
GORDON BARTELS CO.
Roller Coating Specialists

(Left to right) Michael M. Sadlowski, John Schmidt, and Edward J. Petrenik

sales promotion divisions of General Electric Company's Apparatus Department, is a graduate of Wooster College. Wooster, Ohio, and will be in charge of planning and administering advertising and relations with advertising agencies.

LEWIS P. MERCER, educated at the University of Michigan and formerly with the sales department of Dodge Motor Company, came to Carborundum in 1946 and was supervisor of sales training, and subsequently assistant manager of the hardware and automotive sales department prior to his appointment as manager of Sales Promotion. He will supervise training for sales personnel and distributors, develop special sales promotion programs and materials, catalogues, and industrial exhibits.

E. DENT LACKEY, public relations manager, came to Carborundum in 1948 and prior to his present appointment was assistant director of Industrial Relations, handling public relations in that position. As public relations manager, Mr. Lackey will be responsible for community relations, press, radio, films, and company publications.

Standard Varnish Works, Linden, N. J., has recently announced the following changes in the management of the Lacquer Division:

MICHAEL M. SADLOWSKI has been appointed plant manager; **JOHN SCHMIDT,** production superintendent; and **EDWARD J. PETRENIK,** chief chemist.

Both Mr. Sadlowski and Mr. Schmidt have served in Standard's Lacquer Division for many years. Mr. Petrenik, a newcomer, has been active in the research and development of paints and lacquers for several prominent manufacturers.

KARL F. JUND has joined the technical staff of The Globe Chemical Co., Cincinnati, Ohio, and will be in charge of the administration and technical service associated with the Battelle electropolishing and chemical polishing processes.

Mr. Jund was formerly chief chemist for the McCauley Corporation of Dayton, Ohio, in charge of the electrochemical finishing division.

Directors of the new Marketing Department of The Carborundum Company: (seated left to right) Arthur W. Cowles, Frederick T. Keeler, and Lewis P. Mercer; (standing left to right) E. Dent Lackey, and Arthur Batts, Jr.

FOR HIGH PRODUCTION POLISHING and BUFFING

ACME Automatic
POLISHING and BUFFING MACHINES

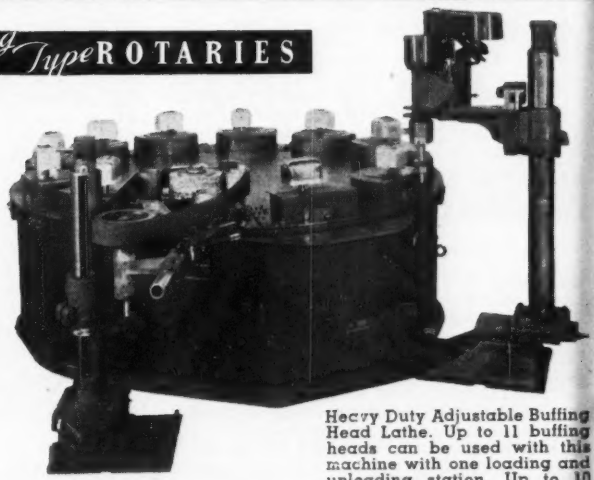
ACME Indexing Type ROTARIES

ONE SECOND INDEXING TIME BETWEEN STATIONS

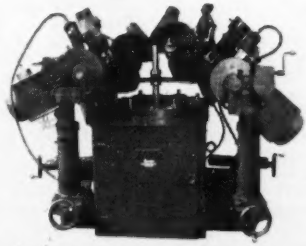
One second indexing time is a standard feature of all ACME Indexing Type Rotaries. Output can be standardized at high levels with uniform finish. Dwell time of wheel on work can be controlled while indexing time between stations is held to the one second interval.

•

Right: ACME ten foot Indexing Type Rotary with 12 station table. It is shown with one ACME G-3 Polishing Belt Head Lathe and one G-1 15 HP



Heavy Duty Adjustable Buffing Head Lathe. Up to 11 buffing heads can be used with this machine with one loading and unloading station. Up to 10 heads can be used with 2 loading and unloading stations opposite each other giving the equivalent of two 5 head machines.



•

Left: ACME 30 inch, Six Station Indexing Type Rotary using four ACME Adjustable Floating Head Polishing and Buffing Lathes. It is equipped with a special hold down tail stock and air lift on heads synchronized with indexing table. This machine is adaptable to many cost cutting arrangements.

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL Polishing and Buffing Machinery

(CATALOGS ON REQUEST)

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME Manufacturing Co.

Builders 1645 HOWARD ST. DETROIT 16, MICH.

EDWIN S. LADLEY has been named assistant director of purchases of Hercules Powder Company, Lawrence J. Finnan, Jr., director of purchases, has announced. He succeeds **WILLIAM L. HEWES**, who retired December 31 after 41 years of service.

Mr. Ladley has been associated with Hercules Powder Company since 1942.

Chet Borlet

CHET BORLET recently joined the sales and service staff of United Chromium, Incorporated. Mr. Borlet, who received his higher education at Kent State University, has been well known for the past 15 years as a member of the plating sales department of The Harshaw Chemical Company.

For the last eight years Mr. Borlet has been located in Detroit where he has been active in the local branch of the American Electroplaters' society. At the last annual meeting he was elected to serve on the board of managers of the Society.

Upon completion of orientation courses at the United Chromium organic coatings laboratories and plating laboratories at Carteret and Detroit, Mr. Borlet will report to the Los Angeles regional office.

Elmer A. Lord

Cowles Chemical Co., Cleveland, Ohio, has announced the promotion of **ELMER A. LORD** to the position of sales promotion manager. Mr. Lord will be in charge of the company's advertising sales promotion, and public relations activities in all departments. He fills the position held for the past five years by James A. Barnes, who is leaving to edit "Starchroom Laundry Journal."

A native of Cleveland, Mr. Lord was graduated from Western Reserve University in 1947. Since that time, he has been employed with Cowles in both the production and sales departments.

Donald L. Patrick

DONALD L. PATRICK was recently appointed to head Division No. 4 of the Indianapolis Civil Defense Program as a deputy director. He will have complete charge of radiological defense, chemical defense, bomb reconnaissance, and special weapon defense.

A graduate of the General Motors Institute of Technology, Mr. Patrick specialized in mechanical, electrical, chemical, and industrial engineering. An employee of the U. S. Naval Ordnance Plant, he was recently awarded the Superior Accomplishment Reward as a result of his engineering work and organization of training courses and instruction in radiological defense.

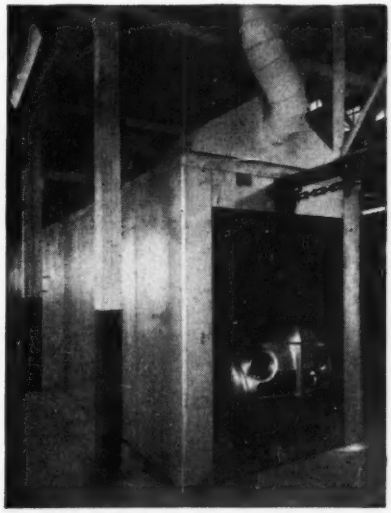
Mr. Patrick is an active member of the Indianapolis Branch, A.E.S.

The Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced the appointment of **GERHARD E. VERSTEGEN** to its staff of equipment sales engineers. Mr. Verstegen attended the Universities of Buffalo and Michigan where he studied mechanical and hydraulic engineering. He has had wide experience in the design and engineering of hydraulic equipment, including die casting machinery.

Gerhard E. Verstegen

For H-VW-M he will specialize on full and semi-

Our know how + Your needs = Better Ovens for You



FOR BETTER FINISHING IN YOUR PLANT . . . IT'S

YOUNG & BERTKE OVENS

EVERY TIME

• As experts with years of practical experience in the design and installation of ovens and finishing systems, Young & Bertke engineers offer you practical help. No oven problem is too large or too small. Young & Bertke has designed and installed literally hundreds of ovens and finishing systems, from small laboratory testing ovens to the largest type conveyor ovens.

You are under no obligation when yon consult us on your problems. We are always glad to give you our advice and assistance.

WHATEVER YOUR FINISHING NEEDS

- Baking
- Drying
- Japanning
- Lacquering
- Enameling
- Rack
- Conveyor
- Vertical Type
- Horizontal Type
- Tunnel

Ovens — Fume Removal Systems — Spray Booths

The YOUNG BERTKE Co.

1126 BUCK STREET **CINCINNATI, OHIO**

automatic conveyors, with headquarters in the Chicago office.

EDWIN E. McCONNELL, controller of Norton Company, and **LEWIS S. GREENLEAF, JR.,** formerly vice president in charge of sales of Durex Corporation and of Durex Abrasives Corporation, were elected members of Norton Company's board of directors at the 65th annual stockholders' meeting.

THOMAS S. GREEN, a Norton director for 13 years, whose retirement comes early this year, has retired from the board.

Mr. McConnell, sixteen years with Norton Company, also becomes a member of the company's executive committee, which he has served in an advisory capacity for the past three years.

R. A. HOFFMAN is now director of research of Allied Research Products, Inc., Baltimore, Md. He joined the company in February 1950, having previously been associated with Du Pont as a research chemist and The R. A. Hoffman Chemical Company, Cleveland, as president.

Mr. Hoffman is a graduate of Ohio State University and later received the degree of master of chemistry from Western Reserve University.

W. M. TEETS has been transferred from the laboratory staff to the sales force by the Hanson-Van Winkle-Munning Co., Matawan, N. J., with headquarters in the company offices in New York.

W. M. Teets

Following graduation from Lafayette College in Easton, Pennsylvania, Mr. Teets joined Hanson-Van Winkle - Munning Company where he worked in the laboratory to gain a knowledge of plating and polishing, preparing for his present position as salesman in the Metropolitan area.

WOOD TANKS

Built to Specifications

66 YEARS OF TANK BUILDING SERVICE

Plating and pickling tanks built to your specifications is a Kalamazoo specialty — any size or shape — fir, oak, cypress or redwood.

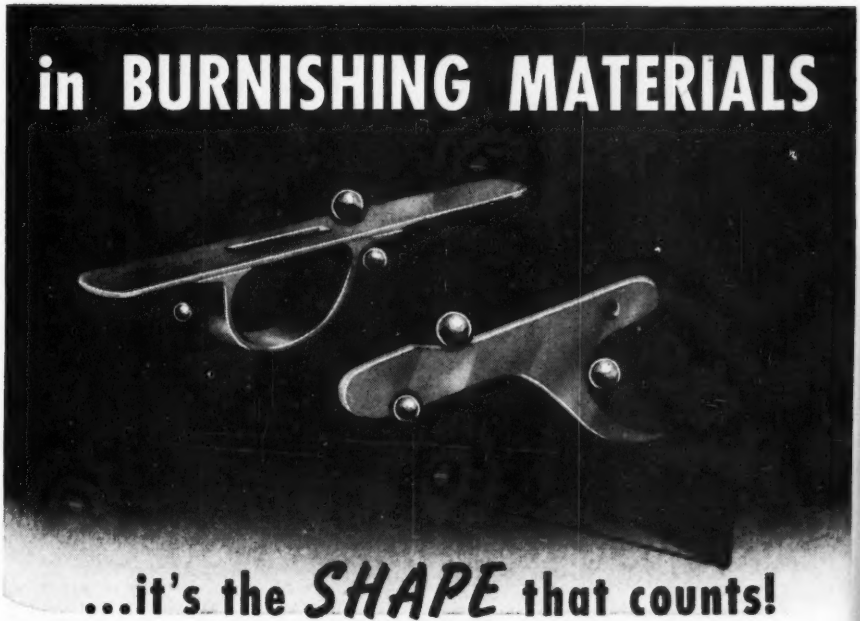
Tanks on left were made for large manufacturer of automobiles. They are 88" x 64" x 62" — made of 8" long-leaf yellow pine with B & M anti-acid metal tie rods.

Write today for estimates and suggestions.

Kalamazoo TANK AND SILO COMPANY

228 HARRISON ST. • KALAMAZOO, MICH.

in BURNISHING MATERIALS



...it's the *SHAPE* that counts!

Triggers; Trigger Guards and other parts of military and sporting rifles must have smoothly burnished surfaces. Many of these parts are processed with Abbott Burnishing BALLS. They're shaped to do the job right!

Abbott Burnishing Shapes — Ball, Ovalball, Cone, Diagonal, Pin — are scientifically designed to make effective contact on metal stampings and castings of any shape or size. Each is made from high quality, Abbott bearing ball steel, deep hardened and polished to a mirrorlike, glass hard finish. For superior burnishing . . . use Abbott.

ABBOTT

the all round ball

WRITE for Catalog-Manual which gives full information and helpful hints.

THE ABBOTT BALL COMPANY

1064 **New Britain Ave.**

Hartford 10, Conn., U.S.A.

Michael M. Carmody

Liquid Plastics Division, Ferro Enamel Corp., Cleveland, Ohio, manufacturer of Vedoc organic finishes, announces the appointment of **MICHAEL M. CARMODY** as Central sales manager. In this capacity, Mr. Carmody will have charge of Vedoc industrial finishes in the southern half of Indiana, Ohio, and all of Kentucky.

Since 1922 Mr. Carmody has been associated with the manufacturing and selling of industrial and trade sales paints, varnishes and lacquers.

TRAINING COURSES

The list of speakers for the 15-week seminar and public lecture series on "Prevention of Corrosion," sponsored by the **GRADUATE SCHOOL OF STEVENS INSTITUTE OF TECHNOLOGY** in cooperation with the **NATIONAL ASSOCIATION OF CORROSION ENGINEERS**, has been announced.

The lectures, to be given on consecutive Wednesday nights on the Stevens campus, will follow class study of corrosion prevention methods in the second of two courses taught by Robert S. MacCormack of the Colgate Palmolive-Peet Company, Jersey City. The courses were designed for chemists, engineers, metallurgists, and manufacturers who desire knowledge of fundamental factors and solutions of corrosion problems.

The lectures will be as follows: February 7, "Review of Corrosion Factors," by T. P. May, International Nickel Company, New York; February 14, "Design Features," by R. H. Brown, Aluminum Company of America, New Kensington, Pa.; February 21, "Humidity Control," by P. Bachman, Davison Chemical Corp., Baltimore, Md.; February 28, "Deaeration," by J. D. Yoder, The Permutit Co., New York; March 7, "Inhibitors," by G. E. Best, Mutual Chemical Company of America, Baltimore, Md.; March 14, "Light Metals and Alloys," by E. D. Verink, Aluminum Company of America, New Kensington, Pa.; March 28, "Copper and Its Alloys," by C. L. Bulow, Bridgeport Brass Co., Bridgeport, Conn.; April 4, "Nickel and Its Alloys," by W. Z. Friend, International Nickel Co., New York; April 11, "Iron and Stainless Alloys," F. L. LaQue, International Nickel Co., New York; April 18, "High Temperature Alloys," by E. M. Skinner, International Nickel Co., New York; April 25, "Electrodeposited Metal Coatings," by C. H. Sample, International Nickel Co., New York; May 2, "Alloys of Lead, Zinc, etc." by G. O. Hiers, National Lead Co., Brooklyn, N. Y.; May 9, "Cathodic Protection," by L. H. Sudrabin, Electro Rustproofing Corp., Belleville, N. J.; May 16, "Paints and Organic Coatings," by R. M. Burns, Bell Telephone Laboratories, Murray Hill, N. J.; and May 23, "Plastics, Rubber, Non-metals," by K. Tator, Kenneth Tator Associates, Coraopolis, Pa.

Registration will be limited. Persons wishing to attend should apply to the Office of the Graduate School, Stevens Institute of Technology. Hoboken, N. J.

RANDOLPH

LACQUERS, ENAMELS
DOPES, THINNERS
Clear Metal Finishes
Clear S.G. For Metal
Colored Lacquers
Texture Enamels
Aircraft Finishes
Specialized Production Finishes

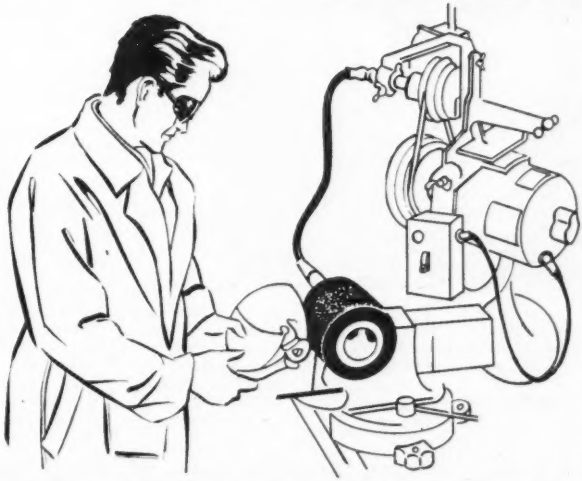
PRODUCTS

RANDOLPH PRODUCTS Co.
CARLSTADT, NEW JERSEY

HONORS

Established in 1947 by Board Chairman R. A. Weaver of Ferro Enamel Corporation, the annual R. A. Weaver Award for outstanding contributions to

NEW, IMPROVED **NU-MATIC**



THE WHEEL WITH THE PNEUMATIC DRUM

With this Nu-Matic wheel the abrasive belt rides on a cushion of air contained in a rubber drum. Different pressures in the drum and different grits provide varied surface finishes. Deflate, and belts can be changed easily and quickly for grinding, sanding or polishing. Cut your labor, production and inventory costs with Nu-Matic grinding units. Adapters for ⅝"-11 or ½"-13 power equipment. (Specify size.)

Adaptable to bench, portable or flexible shaft power.

NU-MATIC GRINDERS, INC., 10304 W. McNICHOLS RD.

Detroit 21, Michigan UNiversity 3-2573

Board Chairman R. A. Weaver, of the Ferro Enamel Corporation, presenting the Annual R. A. Weaver Award to Earl D. Skillicorn, manager of Process and Quality Control.

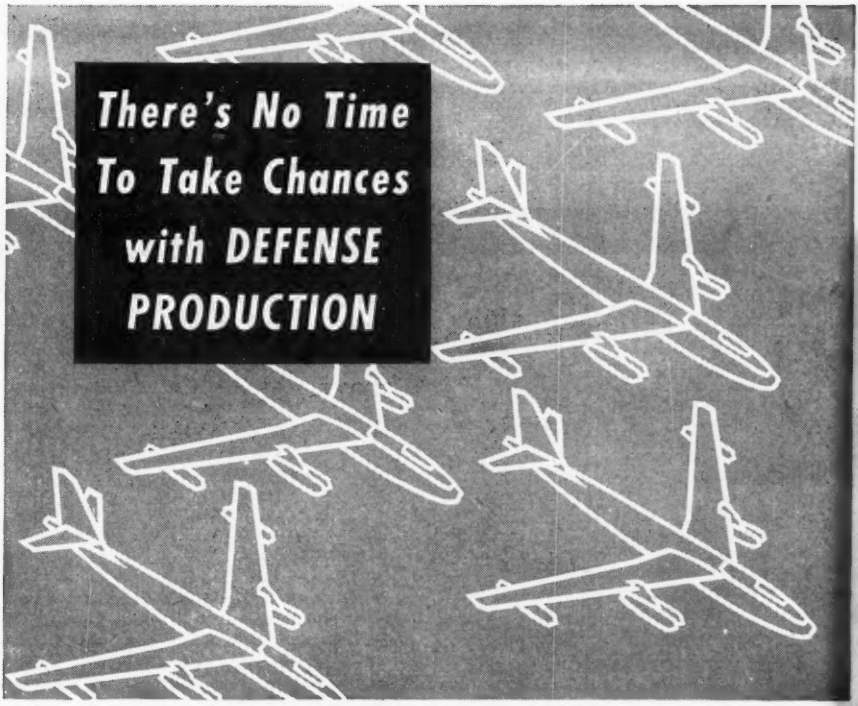
the porcelain enameling industry and to the company was presented to **EARL D. SKILLICORN**, manager of Process and Quality Control.

The award was made at a dinner for company executives, in Cleveland, and was accompanied by a cash prize and a 15-year service pin. Given annually to the person who has done most for the company in the opinion of a committee of Ferro Enamel executives, the award cited Mr. Skillicorn for his part in "maintaining highest quality production under difficult conditions and in helping to set new production records."

Mr. Skillicorn has been with Ferro Enamel since he graduated from Kent State University in 1935, except for a three-year period when he was manager of Porcelain Enameling Control for Seegar Refrigerator Co., Evansville, Ind. He rejoined Ferro in 1942 in the customer service laboratory, and assumed his present position in 1949.

Also receiving jeweled service pins at

Board Chairman R. A. Weaver presenting 20-year service pin to President C. D. Clawson as other Ferro executives look on. Presentation was made at executives' dinner held in Cleveland, Ohio. on December 14, 1950.



Steel Parts Finishing, a vital requirement in defense production, must be handled with proven processes, methods, and materials. Don't take chances that may hamper production efforts.

DU-LITE Black Oxide STEEL FINISH has long demonstrated its superior qualities — its uniformity — its aid to lubrication when applied to engine bearings. Furthermore it is economical, and backed by Du-Lite's guarantee of results.

Leading manufacturers throughout the country, producing vehicle, aircraft, tank and marine engines, arms, bomb parts, instruments, tools, and machine parts, are using Du-Lite. If you want your product to measure up to the most rigid specifications use DU-LITE Black Oxide STEEL FINISH.

THE DU-LITE CHEMICAL CORPORATION

100 RIVER ROAD • MIDDLETOWN • CONN.

the dinner were: President **C. D. CLAWSON**, 20 years; Executive Vice President **F. S. MARKERT**, 25 years; **L. H. MILLER**, manager of the Vedoc Division, 10 years; **W. B. OWEN**, production manager, 20 years; **C. M. ANDREWS**, technical director of the International Division, 5 years; and **H. C. TUCKER**, manager of the Glaze Frit Division, 10 years.

SOCIETIES

The **SIXTH ANNUAL EDUCATIONAL SESSION AND DINNER DANCE** of the **DAYTON BRANCH, AMERICAN ELECTROPLATERS' SOCIETY,** will be held March 3, 1951, at the Biltmore Hotel, Dayton, Ohio.

The educational session, beginning at 1:30 p.m., will feature the folowing speakers and subjects: "Engineering Aspects of Plating Room Layout" by S. M. Martin, United Chromium, Inc.; "Wearing Characteristics of Some Common Electrodeposited Metals," by R. F. Ledford, Hanson-Van Winkle-Munning Company; "Alloy Plating" by Dr. Charles L. Faust, Battelle Memorial Institute.

The banquet is scheduled for 6:30 p.m., to be followed by a floor show and dancing.

Looking for a Better Finish?

Try

HARRISON'S

4A

TAILOR-MADE BUFFING & POLISHING COMPOUNDS

for

Aluminum, Brass, Copper, Stainless Steel, Carbon Steel, Etc.

EMERY CAKE, GREASE STICK

CEMENT AND THINNER
for setting up wheels, belts, and rolls

HARRISON & COMPANY, INC.
Haverhill, Massachusetts

Tickets at $6.00 per person may be obtained from Paul Geske, treasurer of the Dayton Branch, 41 South Bromfield Road, Dayton 9, Ohio.

meetings

OF INTEREST TO FINISHERS

Feb. 17. Annual Educational Session and Banquet, New York Branch, A.E.S., Hotel New Yorker, New York, New York.

Mar. 3. Sixth Annual Educational Session and Dinner Dance, Dayton Branch, A.E.S., Biltmore Hotel, Dayton, Ohio.

Mar. 5-9. Spring Meeting and Committee Week, American Society for Testing Materials, Cincinnati, Ohio.

Mar. 13-16. 1951 Conference and Exhibition, National Association of Corrosion Engineers, Statler Hotel, New York, New York.

Mar. 19-23. Seventh Western Metal Congress and Exposition, Civic Auditorium and Exposition Hall, Oakland, California.

Mar. 21-22. 16th Annual Meeting, American Hot Dip Galvanizers Association, Inc., Biltmore Hotel, Atlanta, Georgia.

Mar. 31. Annual Educational Meeting and Dinner, Rockford Branch, A.E.S., Faust Hotel, Rockford, Illinois.

Apr. 7. Annual Technical Session and Banquet, Boston Branch, A.E.S., Hotel Statler, Boston, Massachusetts.

Apr. 25-26. Seventh Annual Meeting of the Metal Powder Association and Metal Powder Show, Hotel Cleveland, Cleveland, Ohio.

Apr. 28. Annual Meeting and Banquet, Milwaukee Branch, A.E.S., Schroeder Hotel, Milwaukee, Wisconsin.

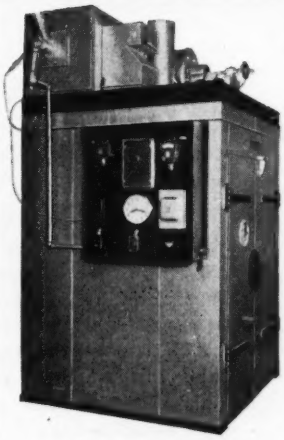
June 18-22. Annual Meeting, American Society for Testing Materials, Atlantic City, New Jersey.

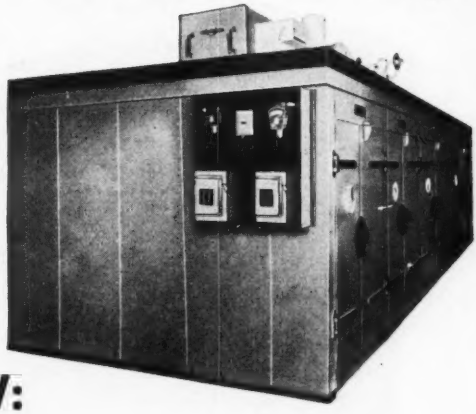
Oct. 29-31. 63rd Annual Convention, National Paint, Varnish and Lacquer Association, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

Nov. 1-3. 29th Annual Meeting, Federation of Paint and Varnish Production Clubs, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

KOCH OVENS

Save You Money!





HERE'S HOW:

They're production-line assembled . . . built from standard parts, thus give you all the cost advantages of mass production. They're super-efficient, shop tested before delivery, guaranteed to do your job at minimum cost. Backed by 76 years of metal-working experience. That speaks for itself!

MAIL COUPON FOR COMPLETE OVEN FOLDER!

GEORGE KOCH SONS, Inc.
Evansville 4, Indiana

GEORGE KOCH SONS, INC.
EVANSVILLE 4, INDIANA

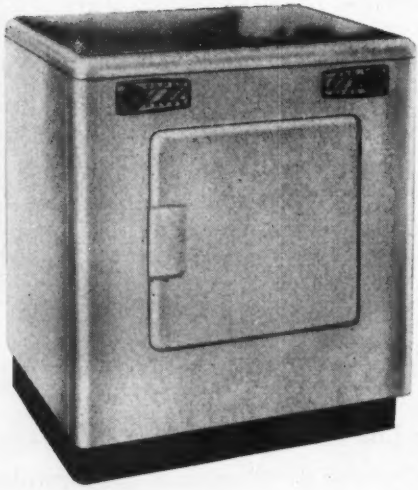
Gentlemen: Please rush your folder showing the entire line of KOCH ovens.

Firm .....

Address .....

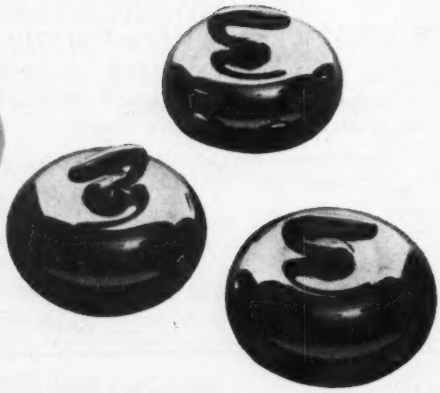
City ..... State .....

Finishes



The Temco Automatic Gas Clothes Dryer featuring a single control, the Sun Dial, is finished on the outside in white synthetic baking enamel. The combustion chamber in the heating unit is finished inside and out with porcelain enamel.

(Photo courtesy TEMCO, Inc., Nashville 9, Tenn.)



Miniature curling stones fabricated from magnesium are plated with copper and chromium.

(Photo courtesy Dow Chemical Co., Midland, Mich.)

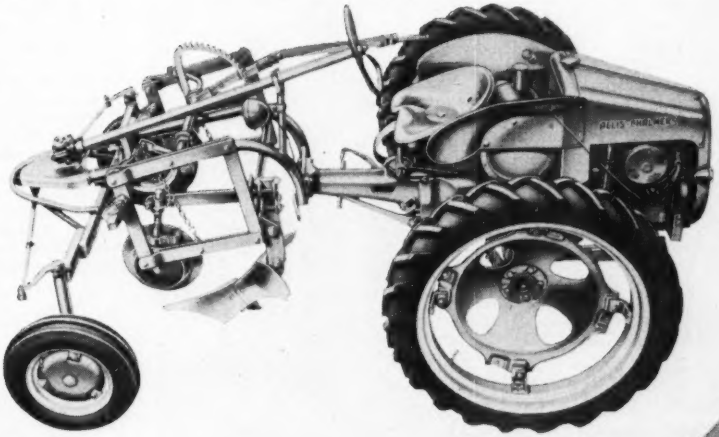
that aid in appearance and utility

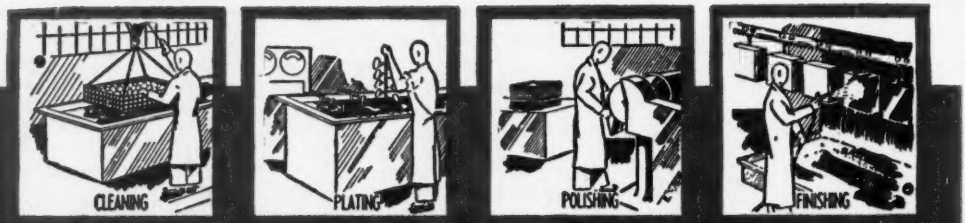
The taupe wrinkle finish applied by electrostatic spray to the Friden STW Fully-Automatic Calculator was specially developed for the purpose by Maas & Waldstein Company.

(Photo courtesy Friden Calculating Machine Co., Inc., San Leandro, Calif.)

The Allis-Chalmers rear-engine-mounted Model "G" Farm Tractor is finished with an oil modified alkyd resin base enamel baked on for 45 minutes at 225 deg. F.

(Photo courtesy Allis-Chalmers Manufacturing Co., Tractor Div., Milwaukee 1, Wis.)





New • EQUIPMENT • MATERIALS • PROCESSES

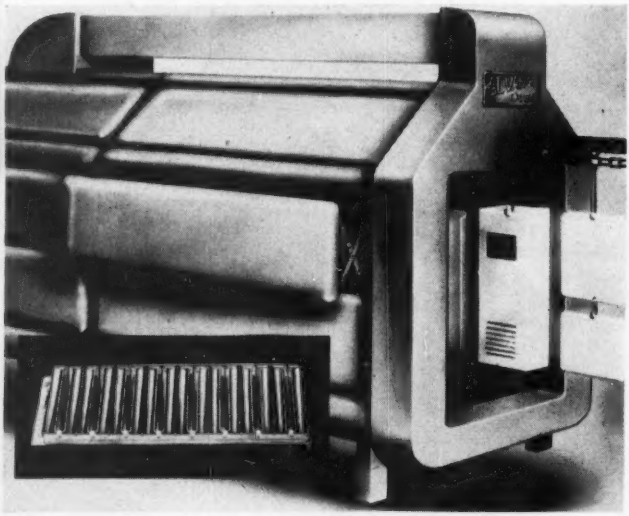
Industrial Oven Construction

A type of industrial oven construction composed of electric heater panels and standardized frame members has been announced by the Advance Heating Division of Jensen Specialties, Inc., 9331 Freeland Ave., Detroit 28, Mich. Utilizing high-efficiency rod-type heaters mounted on insulated oven wall sections, it combines high-speed radiant heating with temperature-controlled convection for heating and drying operations up to 700 deg. Fahrenheit.

Ovens of any size, shape, and heat capacity can be field-assembled from standard parts by electric maintenance personnel, and rod heaters of any standard brand name may be specified, the manufacturer states. When equipped with approved controls and ventilation, the ovens comply with the latest industrial oven standards.

The manufacturer provides engineering service to guide proper selection and use of the equipment. Since no welding is required for assembly, the ovens can be enlarged, extended, or dismantled with changes made in the heating transfer rates, when and as required, simply by the addition or removal of standard catalog parts.

Provisions are made for maintaining all vital parts from outside the oven assembly. Long-life parts are used throughout, reducing operation and maintenance costs; also conversion of electric to thermal energy at



Advance Oven showing panel section extended for servicing. Inset below: working side of this panel with rod-type electric heaters and reflectors.

the point of use takes place without combustion, transmission, or secondary energy losses, it is claimed.

To increase the output of continuous-type ovens and driers now in use, whether they are fuel-fired, steam, or electric, Advance heater panels can be added at the entrance end. From 4 to 40 kilowatts of heat may be secured from each 26 x 84-inch panel.

D-Scale-RW

The Magnus Chemical Co., Inc., Dept. PF, Garwood, N. J., has announced the development of D-Scale-RW, a compound used for descaling or derusting iron or steel parts in tumbling barrels.

Extensive tests have shown that Magnus D-Scale-RW removes most scale in 15 to 30 minutes, with up to 60 minutes being required in a few cases. It often saves from 1 to 4 hours in finishing a load of parts as compared with other methods. Other advantages claimed are: it can be used either where parts are self-tumbled or with abrasive media; it is safe to handle and does not throw off fumes to cause rusting of equipment or parts in the room where it is used; it removes scale completely, resulting in an attractive part.

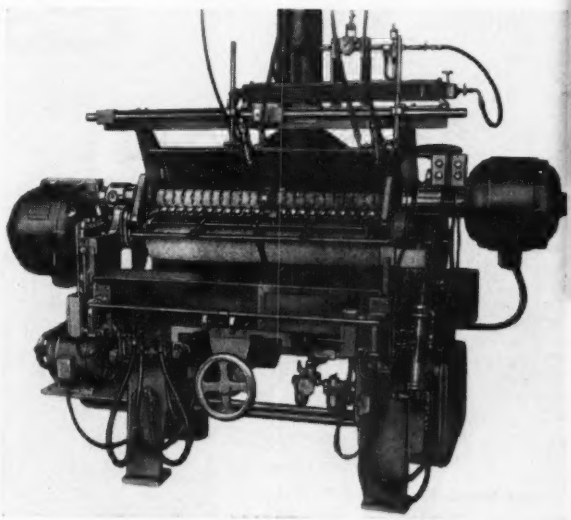
Magnus D-Scale-RW is an inhibited acid type powder with wetting agent added. It is used at concentrations of 4 to 16 ounces per gallon of water, depending upon the amount of scale. The use of hot water speeds up the descaling action. As soon as the scale is removed, fresh water is run into the barrel to flush the parts and kill the D-Scale-RW solution. Excess water is then dumped out and a pound or two of alkali is added to neutralize the acid solution. The barrel is then run about five minutes and drained. When descaling is done in closed barrels, the barrels should be vented at intervals to prevent an accumulation of gas pressure within the barrel.

Clair No. 204 Surface Finishing Machine

A surface finishing machine capable of simultaneous coverage both inside and outside of spoon and fork bowls and similarly shaped small parts has been introduced by Clair Manufacturing Co., 1010 S. Union St., Olean, New York.

Although developed through cooperation with several large silverware manufacturers, the Clair No. 204 Surface Finishing Machine is recommended for use where similar contour problems exist. In operation, the rack of the machine moves in order to expose simultaneously the inside of the bowl-like shape to small diameter preformed convex buffs, and the outside diameter to large diameter concave buffs. Adjustments which compensate for variations in bowl depth and length are included in the design.

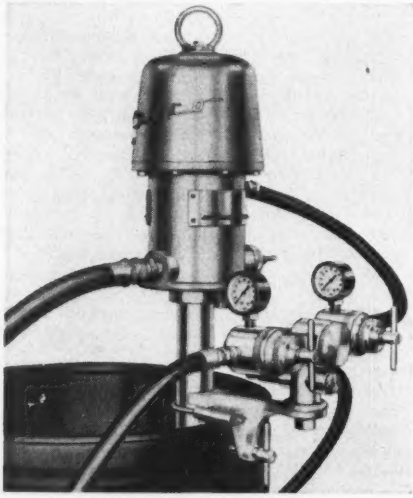
Featuring a waist-high design for ease in loading, the two-spindle unit has an electro-hydraulic actuation system, with totally enclosed hydraulic circuits which are invulnerable to abrasives. Rolls are opened and closed by a compressed air circuit which also permits automatic float of the counterbalanced rolls in following irregular contours. A minimum working space 38 inches wide is provided by 40-inch long rolls in diameters up to 9 inches. Adjustments for speed and magnitude may be made without stopping the machine.



Clair No. 204 Surface Finishing Machine

Graco Mogul-Type Powerflo Pump

Spray gun spurting, which often projects a blob of heavy industrial material upon the coated surface, is completely eliminated by the Graco Mogul-Type Powerflo Pump. This air-operated, high volume material handling pump is equipped with a device called the Evenflo, which positively prevents spurting, according to the manufacturer, Graco Co., Inc., Industrial Div., Graco Sq., Minneapolis 13, Minn. Surfaces can be coated evenly to meet rigid specifications.



Graco Mogul-Type Powerflo Pump

Operating in an original 400- and 100-pound drum or in a bucket-type container, the pump supplies material through a hose for spray gun, pole gun, or extrusion gun application.

The extra high volume Mogul Pump operates within a broad air pressure range of from 20 to 175 p.s.i. and can be powered by air compressors with either large or small output capacities.

Rust and corrosion preventives, caulking compounds, adhesives, sound deadeners, roofing materials, undercoaters, and many other industrial materials can be pumped quickly and in great volume with the Graco Mogul. Even gummy mastics and other non-self-leveling substances can be handled easily, it is claimed.

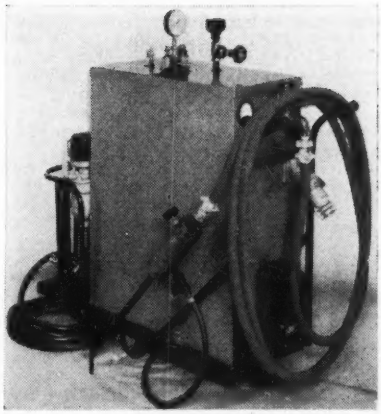
Simple in design and construction, the Graco Mogul-Type Powerflo Pump weighs only 35 pounds. Other characteristics include: power head of cast aluminum; air motor which incorporates steel forgings and machined castings for durability, and large poppet valves for increased efficiency; easily changed O-rings which provide leakproof seals in the air motor; balanced double action piston for smooth, high-volume delivery.

Graco Mogul-Type Powerflo Pump in use

"Speedylectric" Steam-Jet Cleaner JC-20

Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass., is manufacturing a small Steam-Jet Cleaner identified as the JC-20. Like the "Speedylectric" JC-30, this model is an all-electric, portable unit, only 16 inches wide and 40 inches long.

Featuring simplicity of operation, the JC-20 cleans machinery, equipment, and facilities effectively, safely, and si-



"Speedylectric" Steam-Jet Cleaner JC-20

lently, and may be operated in a crowded factory or workroom without danger or annoyance to nearby operators on adjacent machines. Using steam from the built-in high pressure Speedylectric boiler, dirt, grease, oil, and caked-on accumulations are said to melt away. There is no flooding of the working area, no smoke, flames, or fire hazard, it is claimed. The unit is completely free of low water danger. The boiler water itself is the electric resistance heating element, and if there is no water, no current passes and no steam is generated. The boiler is the Speedylectric Model 600-3, built under ASME Code, and is available for 220, 440, or 550 volts.

Impervious Graphite Pump

"Karbate" Brand Impervious Graphite Pump, manufactured by the National Carbon Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y., is claimed to fulfill the demand for standard all-purpose corrosion resistant equipment. A pump purchased for a specific service can be used in almost any change made in chemical operating conditions, it is said. "Karbate" impervious graphite resists the action of acids, alkalies, salt solutions, and organic compounds.

Utilizing a Teflon gasketed mechanical seal, the pump provides low maintenance with minimum servicing and replacement parts, and complete freedom from product contamination; and embodies "Karbate" graphite case, impeller, and a Rotary seal that eliminates the stuffing box.

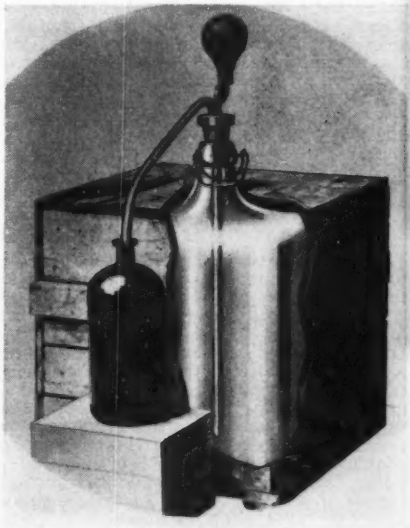
Pneumatic Acid Pump

A safe and efficient device for handling acids and other liquids, a pneumatic bulb type acid pump, is obtainable from the Hanson-Van Winkle-Munning Co., Matawan, N. J. The primary feature of this plating room "widget" is the reduction in fumes which it effects.

By the use of this pump, it is possible to fill bottles with small neck openings without the use of a funnel. The stream of acid is smooth and absolutely free from spurts from start to finish. The action is much faster than a siphon as it puts the proper pressure on top of the liquid to force it out of the continuous tube, the manufacturer states. No air pressure is generated inside the carboy.

Due to its compactness, the pump is easily transferred from one container to another. The overflow pipe has no connection with the valve body and when the pump is withdrawn, no acid remains in it. It also serves as a gage, showing the amount of acid left in the carboy.

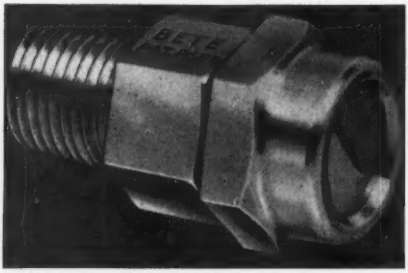
Saran plastic tubes are featured. Also available are tubes of lead, hard rubber, or aluminum.



Pneumatic Acid Pump

Bete Improved Fan Nozzle

An improved line of flat spray or fan nozzle has been announced by Bete Fog Nozzle, Inc., Greenfield, Massachusetts.



Bete Improved Fan Nozzle

More uniform coverage with less waste of spray is claimed for the nozzle. Side jets or "horns" containing coarse droplets have been eliminated and the spray pattern made heavier in the center than at the edges of the fan.

According to the manufacturer, there is less overspraying due to doubling up of the sprays from adjacent nozzles, with the result that the combined coverage is unusually uniform.

The Bete "F" Series Nozzle includes 13 discs made of long-wearing stainless steel with flow rates of 1/10 to 10 g.p.m. and spray angles of 50 to 90 degrees. All discs are interchangeable in a brass base and cap assembly having a ¼-inch male pipe connection. Built-in, removable strainers are available for the smaller nozzles.

Zinc-Saving Iridite Finish

An Iridite treatment for bright-type finishing of zinc plate in automatic plating machinery has been announced by Allied Research Products, Inc., 4004 E. Monument St., Baltimore 2, Md. Like all Iridite finishes, this compound produces a protective chromate film on the surface of the treated parts. However, according to the manufacturer, its most important advantage is the fact that the protective film can be produced on zinc coatings of less than 0.0001-inch thickness. Thus, its use will enable manufacturers of zinc plated products to stretch available zinc supplies further.

The Iridite coating is bluish bright or yellow iridescent, depending upon the user's choice of operating conditions. Corrosion resistance varies upward with the intensity of the iridescence, it is said. Completely flexible in use, it can be applied from an immersion time that may vary from 20 seconds up to more than a full minute. No bleaching operation is required. Also, no special equipment is needed for installation.

The product is shipped to users as a combination of a liquid and a powder.

"Griprite" Rubber Glove

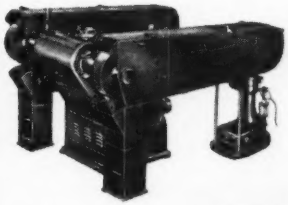
A rubber glove, called "Griprite", has been announced by The B. F. Goodrich Co., Akron, Ohio. Made with a roughened surface which is an integral part of the glove, it ensures a firm, tight grip even in the wettest application, allowing work under these conditions to be accomplished with ease and speed. The glove enables the wearer to grip the smallest objects firmly and with confidence.

Made by the Anode process, the glove has curved fingers, is 14 inches long, identified by an orange band at the cuff, and made in sizes 9, 10 and 11, in black.

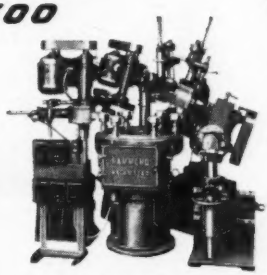
Advantages of the glove, the manufacturer states, are its high tensile, uniform strength, excellent snag and tear resistance, flexibility, and long life.

"Griprite" Rubber Glove

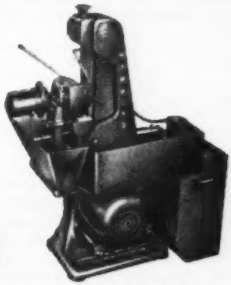
Hammond
of KALAMAZOO



Model "VRO" Variable Speed Polishing Lathe and No. 3 Backstands.



Model J-34 Rotary Automatic Polishing, Buffing and Deburring Machine



OD-1 Cylindrical Polishing, Finishing and Buffing Machine.

Hammond Machinery Builders

1622 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

Rohco Cadmium and Zinc Brighteners

Manufacturers who must change their plating specifications from critical chromium, nickel, and copper can convert conventional cadmium and zinc baths to yield bright deposits through the employment of Rohco 20XL, Rohco 100 and 303 Brighteners. According to the manufacturer, R. O. Hull & Co., Inc., Dept. AF, 1300 Parsons Court, Rocky River 16, Ohio, the use of these brighteners entails no extra treatment or delay in production.

Rohco 20XL Cadmium Brightener, available as a liquid or powder additive, is claimed to provide deposits of exceptional brilliance, uniformity of thickness, and covering power. Because barrel solutions may be operated up to 105 deg. F., maximum production is maintained.

Rohco 100 Barrel and Rohco 303 Still Zinc Brighteners, available as liquid additives, likewise are claimed to impart an exceptional brilliance. Both exhibit high covering power so that recesses, usually unplated, are easily covered with a substantial thickness of deposit, it is said. Rohco 100 and 303 are readily controlled by visual inspection of deposits.

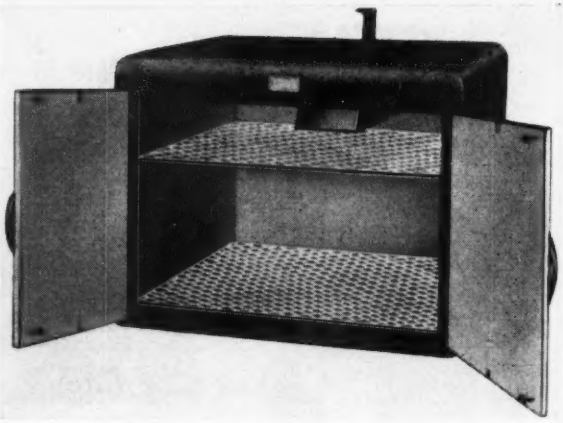
Fulflo Air Filter

One of the "widgets" offered by the Hanson-Van Winkle-Munning Co., Matawan, N. J., for electroplaters is the Fulflo Air Filter to remove rust, scale, dirt, free oil, and moisture from compressed air lines. It is also useful for baths requiring air agitation, for lacquer rooms and for work blowoff purposes, and any other requirements where clean dry air is important. The filter and replacement cartridges are available from stock in ¾-inch pipe size with mounting bracket.

The Fulflo Air Filter is sturdily constructed of steel, and does not have to be disconnected from the air line for service. The head is held in place with a single center bolt and only one nut need be loosened to change the filter element. A non-corrosive metal deflector passes oil and moisture to the sump, after which any remaining traces of free moisture and oil are separated by the cartridge which is sealed at top and bottom so that no unfiltered air can pass, the manufacturer states.

The Fulflo Air Filter operates at pressures up to 125 pounds per square inch with capacity up to 60 cubic feet of free air per minute.

Model CR-1 Portable Electric Oven



VB 248 Glare-Proof Finish

A plastic synthetic finish, VB 248, developed to permit dulling the reflecting surfaces of stainless steel in guided missiles, aircraft instruments, and other apparatus has been announced by the United Lacquer Manufacturing Corp., 1001 W. Elizabeth Ave., Linden 8, N. J. The finish is said to solve the problem of providing an effective coating that would adhere to the highly polished stainless steel used in various aircraft devices.

VB 248 was developed originally in black, and in a dull finish. However, because of its good adhesion to highly polished surfaces, it is expected to find other applications where elimination of glare is not the primary objective. In such cases, the manufacturer states, the synthetic material may be prepared in all colors, in a semi-gloss or gloss finish.

VB 248 requires a baking temperature of 275 deg. F. for one hour.

Portable Electric Oven

Grieve-Hendry Co., Inc., 1101 N. Paulina St., Chicago 22, Ill.. has announced its Portable Electric Oven, which has been found practicable for baking enamels, lacquers, wrinkles, and other finishes; for dehydrating bobbins, coil forms, and paper tubing; for drying plastic granules, and parts after cleaning; and for preheating molds.

An outstanding feature claimed by the manufacturer is the uniform temperature throughout the unit. Fresh air is drawn in and stale air driven out through specially located vents by means of a fan driven by a motor mounted on the outside of the unit. It is claimed that no stratification is possible, and that change of air and forced circulation are advantageous for any dehydration and baking process. An adjustable damper provides wide range of constant temperature.

The portable electric oven is so constructed that one will nest on top the other; it can be used in groups and can be operated as individual ovens, or selected ovens in the group can be cut out or heated at different temperatures.

Capable of heating to 225 deg. F. in 15 minutes, the unit is constructed of heavy gauge steel, with asbestos air-cell insulation. The unit, which is 29 inches wide x 24 inches deep x 20½ inches high, has a single-phase 110-volt motor. No special wiring is required.

Cradle Mounted Centrifugal Pump

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., has announced its Cradle Mounted Centrifugal Pump which incorporates all the features of the Ingersoll-Rand Motorpump. Some of these are deep water-cooled stuffing box, smothering gland, ring oil lubricated ball bearings, a heavy cradle shaft and bearing, sturdy channel steel baseplate, and an all-metal coupling.

The impeller is of the latest hydraulic design, mechanically and hydraulically balanced. An extra deep stuffing box accommodates five or more packing rings and, due to the side-opening cradle, it is easily accessible.

The pump is built in five different sizes, single and two-stage. Sizes range from ¾ to 5-inch discharge with capacities up to 1600 g.p.m. and heads up to 250 feet. Normal horsepower range is from ¼ to 75.

The pump may be driven by direct elec-

Cradle Mounted Centrifugal Pump

tric motor, electric motor and V-belt, turbine through reduction gears, direct turbine, V-belt gasoline engine, or direct gasoline engine.

Kaiser Aluminum Bright Dip

Development of Kaiser Aluminum Bright Dip, a process for brightening aluminum and its alloys, has been announced by Kaiser Aluminum & Chemical Corporation. The process is simple and direct, and easy to control.

According to the manufacturer, laboratory tests show that the dip enhances the appearance of all aluminum alloys, and is particularly effective on high purity aluminum, such alloys as 2S, 3S, 52S, 61S, and 150S, and on the clad forms of 24S and 75S. Products for indoor applications may be dyed following bright dipping and anodizing, or left in their natural color. Bright dipped products can also be used outdoors, it is claimed.

Chief uses for the process include: brightening mill-finish sheet; brightening articles for anodizing and dyeing; increasing total reflectivity of buffed articles; and brightening articles without buffing.

The process is available under license to aluminum fabricators and processors through Kaiser Aluminum & Chemical Sales, Inc., Palmolive Building, Chicago.

Titeflex Filter

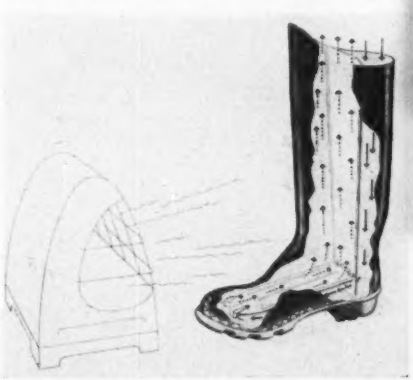
A specially designed filter unit has been announced by Titeflex, Inc., Newark 5, N. J. Constructed of 316 stainless steel, it includes one filter chamber of 10 square feet filtering area and one of 20 square feet area.

Also included is a precoat tank, and the unit is so constructed that filter chambers can be operated simultaneously with the precoat tank, or singly, as required. Thus a choice of 30, 20, or 10 square foot filtration area may be obtained from the same unit, and peak operating efficiency is maintained at all times whether batch sizes are small or large.

This unit uses permanent filtering elements within the chambers. Due to the standard Titeflex backwash system, cleaning of the unit is accomplished in approximately 20 minutes, without manual labor, the manufacturer states.

New Device for Drying Boots

The Mann Engineering Company, 429 Penn Ave., Pittsburgh, Pa., has announced the development of a unique device to reduce the time required to dry the inside of boots. Marketed under the name "Boot-Vent," this unit offers the added advantage of keeping boots in good shape when not in use by holding them straight to prevent cracking and wrinkling. Made of light, corrosion-resistant aluminum, the "Boot-Vent" consists of two stiff plates—the leg piece and the foot piece—which are hinged together. The assembly is arranged so that when the unit is put into the boot, the foot piece will slide out into the foot of the boot and the tapered leg piece will hold the boot open. Once inserted, the "Boot-Vent" provides a partition within the boot which permits air circulation. Heat from the sun or any kind of heater will warm the air in front of the partition



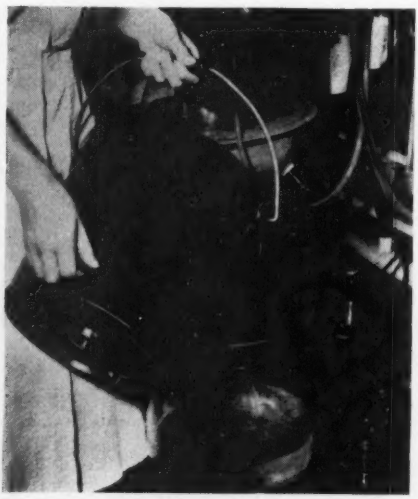
The "Boot-Vent" showing passage of air inside the boot (indicated by arrows).

and set up an air movement which greatly accelerates the drying process. The unit comes in pairs and is designed for use in all boots, sizes 8 to 12 inclusive.

H-VW-M Rubber Pail

Available from the Hanson-Van Winkle-Munning Co., Matawan, N. J., is a molded rubber pail, a strong, durable, and safe-to-handle container for corrosive chemicals.

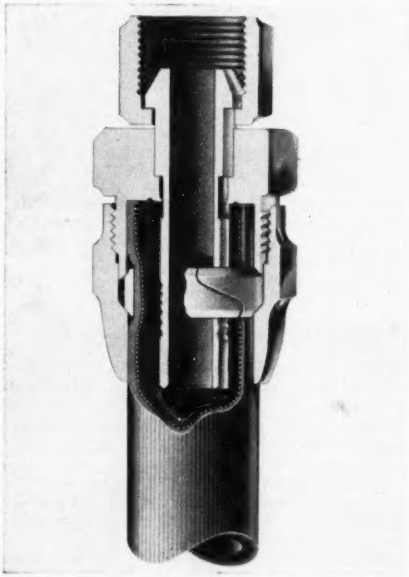
The pail has the following characteristics: (1) A safety-grip construction at the bottom of the pail to provide a firm hold for pouring. Accidents resulting from awkward handling are practically eliminated, it is claimed. (2) Graduated markings on the inside of the pail to permit accurate measurements from 1 to 12 quarts, and from 1 to 3 gallons. (3) A lead-coated, stainless steel, bail-type handle with hard rubber grip to ensure safe handling of the pail and its contents. (4) The handle is molded into the pail in a unique manner, moving freely in cast lead bearings. This allows the handle to move easily but prevents it from pulling out of place. (5) The rubber compound of which the pail is made is slightly flexible but exceedingly tough. More weight can be carried more easily; and (6) The base of the pail is reinforced to make it rigid and strong.



H-VW-M Rubber Pail

DeVilbiss Hose Connections

The DeVilbiss Co., Toledo, Ohio, announces a line of Type HC removable and reusable hose connections to fit common sizes of all kinds of air and fluid hose. Extensive development and research in materials and design have resulted in unusual strength with less bulky shape and with an appreciable reduction in weight.

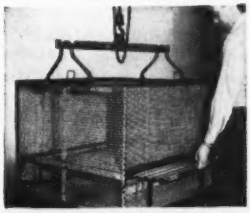


Cutaway view showing various elements of the DeVilbiss Hose Connection

Three separate parts — all reusable and easily detached or removed — make up the HC connections. The sleeve, compression ring, and connection body can all be reused many times, or replaced as hose lengths wear out or become damaged. Parts are not harmed by removal and may be used over and over. When assembled with an ordinary wrench, they form a smooth, tightgrip, leak-proof connection that will not pull loose from the hose, the manufacturer claims. The harder the hose is pulled or jerked, the tighter the wedge grip becomes.

Most any need for fluid or air hose can be met by the extensive variety of thread sizes and various fitting types.

why look further for special metal assemblies? call *Cambridge* your approved source for properly designed crates, racks, trays, baskets or fixtures -- expertly fabricated from any metal or alloy . . .



for processing your products or materials, in bulk, through liquids, heat, gases or corrosive agents.

Submit your own blueprints for quotation, or merely give us the details of the process for which the assembly must be designed. Our trained engineers and metalworkers will do the rest.

Look under "Baskets—Wire" in your Classified Telephone Directory to call your Cambridge Field Engineer, or write direct.

Ask for FREE folder describing Cambridge facilities for special metal fabrications.

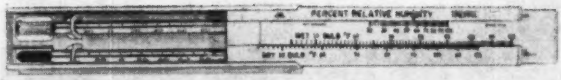
The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department A
Cambridge 2,
Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

"TAG" Pocket Humidicator
Model 8704



M & W Water Dip No. 33

With the shortage of cadmium critical, the use of copper for plating is made practical by immersion of the plated part in a protective coating such as Water Dip No. 33, product of the Mass & Waldstein Co., 438 Riverside Ave., Newark 4, N. J. The dip is claimed to prevent finger printing, water staining, and oxidation.

This method is said to be particularly suited for plating of radio chasses and parts or similar equipment, where soldering or spot welding is required directly on water dip coated metal. Inasmuch as parts can be immersed in Water Dip No. 33 directly from the last hot water rinse with no drying needed, another advantage is the appreciable production time saved.

Relative Humidity Indicator

A precision pocket instrument, shorter than a pencil, that shows relative humidity by the accurate wet-and-dry bulb method has been developed by the Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J. Known as the "TAG" Pocket Humidicator Model 8704, this compact instrument can be used either in the hand or mounted on a wall. A simple built-in slide rule converts the wet-bulb and dry-bulb readings direct into relative humidity, eliminating charts or tables.

The indicator consists of two etched scale glass thermometers, individually hand-calibrated for permanently accurate readings, which are secured in a sturdy white plastic case by integral resilient mountings. The psychometric slide rule forms the cover of the case. For use, a few drops of water are applied to the thermometer wick, and the instrument is fanned or swung for several moments. Setting the wet-bulb reading opposite the dry-bulb reading on the slide rule then indicates relative humidity.

More help for you--

Many of Turco's most famous products were produced under the pressure of *emergency* conditions. One of the largest technical staffs in the cleaning compound industry, new and larger factories (Newark and Rockdale, Ill.) and a record of real service—these put Turco in a position to solve your metal cleaning problems quickly. Call your nearest Turco man!

TURCO

PRODUCTS, INC. Factories: Newark, Rockdale, Ill., Houston, Los Angeles. Service centers and warehouses in over 100 principal cities.

The NEW 60 Series MURRAY-WAY HEAD!

ECONOMICAL ▸
VERSATILE ▸
COMPACT ▸

Here is a head, so compact it can operate on 30" centers—extremely versatile in use and positioning. It will save you many valuable feet of floor space and thousands of dollars in expenditure on smaller table diameters and costly conveyors and fixtures.

The same head may be used either right or left handed, without extra brackets or extensive mechanical adjustment. A quick, simple changeover can be easily made. Special pneumatic controls automatically assure constant, accurate work pressure.

This new head will be available in two models. The #61 rated at 10 to 15 H. P. and the #62 rated at 5 to 7½ H. P. Both carry the outstanding engineering features which have made Murray-Way equipment the finest in the field.

3 Year Spindle Guarantee!

Again Murray-Way takes the lead with this assured quality protection.

Write for our catalog of automatic polishing—buffing—grinding equipment.

MURRAY WAY

THE MURRAY-WAY CORPORATION

3925 WEST FORT STREET • DETROIT 16, MICHIGAN

AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

Bonding Agent R-313

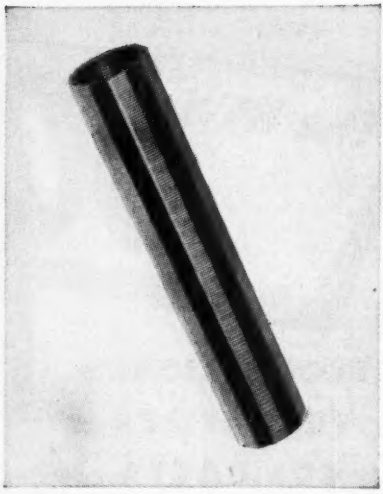
Bonding Agent R-313, an anhydrous thermosetting sealant compound, has been added to the industrial line of Carl H. Biggs Co., 11616 W. Pico Blvd., W. Los Angeles, Calif. Said to be an excellent medium for manually bonding dissimilar and similar materials, it will bond ferrous metals to non-ferrous metals, such as iron, brass, and bronze to aluminum or magnesium; or aluminum to aluminum.

Many industrial sealant problems yield readily to the thermosetting compound, which cures without heat, the manufacturer states. However, it can be cured in 20 minutes by baking at low temperature. Clamps are not necessary to hold parts together during either fast or slow curing processes.

Titeflex "Well-Screen" Membrane

A filtering membrane for its line of industrial filters has been developed by Titeflex, Inc., 50 Frelinghuysen Ave., Newark 5, N. J. Designated as the Titeflex "Well-Screen"' Membrane, the product is normally constructed of 316 ELC stainless steel wire formed to a screen of cylindrical shape. Used within the filter itself, to support the filter cake which is the actual filtration medium, the cylinder speeds up the filtration process. Because of the triangular cross-sectional shape of the individual wire which makes up the cylinder, clogging is eliminated, it is stated.

According to the manufacturer, another advantage is that in backwashing, the automatic process by which Titeflex filters are cleaned without manual labor, the Well-Screen Membrane achieves high efficiency because the backwash flow reaches its highest velocity at the exact point of support of the filter cake.



Titeflex "Well-Screen" Membrane

Although developed specifically for use with Titeflex filters, the unit can be utilized with various other types of filtration equipment. It is available in various sizes, and can be provided in any alloy which can be drawn into wire.

Chemclean Solvent Emulsion Cleaner

Chemclean Solvent Emulsion Cleaner, product of Chemclean Products Corp., 58 Watts St., New York 13, N. Y., is a self-emulsifying solvent which has fast wetting, rapid penetrating, and free rinsing properties that ensure wetting of deepest

FELT DOES IT BETTER

Paramount Brand

FELT WHEELS

• Quality • Better Work • Uniformity

Order PARAMOUNT BRAND Felt Wheels from your supplier. Also, bobs and sheets whenever you need them.

BACON FELT CO. WINCHESTER, MASS.

Established 1824

"America's Oldest Felt Manufacturer"

Send for our Complete Catalog

HARSHAW
supplies Industry with

Electroplating Salts Anodes & Processes

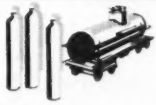
Synthetic Optical Crystals

Driers and Metal Soaps

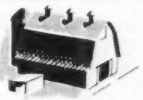
Agricultural Chemicals

Ceramic Opacifiers and Colors

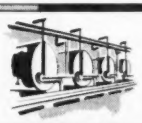
Chemical Commodities



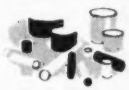
Fluorides



Fungicides



Glycerine



Preformed Catalysts AND Catalytic Chemicals
FOR PETROLEUM AND OTHER ORGANIC PROCESSES

HARSHAW SCIENTIFIC
Supplies chemicals and apparatus for your laboratory.

HARSHAW

THE HARSHAW CHEMICAL CO. • CLEVELAND 6, OHIO
Cleveland • Chicago • Cincinnati • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh

HARSHAW SCIENTIFIC DIVISION OF THE HARSHAW CHEMICAL CO. CLEVELAND 6, OHIO
Cleveland • Cincinnati • Detroit • Houston • Los Angeles • Philadelphia

hard-to-reach recesses and efficiently loosening the bond between base metals and soils.

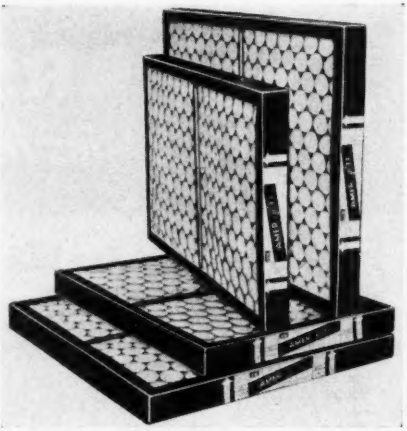
Used as a pre-soak, S.E.C. quickly removes stubborn impacted buffing compounds, drawing oils and compounds, sulfurized and chlorinated cutting oils, greases, and soaps, it is claimed.

According to the manufacturer S.E.C. will not attack any metal or alloy; is nontoxic and practically odorless; is safe and simple to use; has low evaporation, continuous activity, and long life. It can be used at room temperature to 140 deg. F. as is, or in the form of an emulsion at 1:1 or 1:2 parts water. Employed as a spray, it can be used as is, or in the form of an emulsion up to 1:20 parts water; room temperature to 140 degrees Fahrenheit.

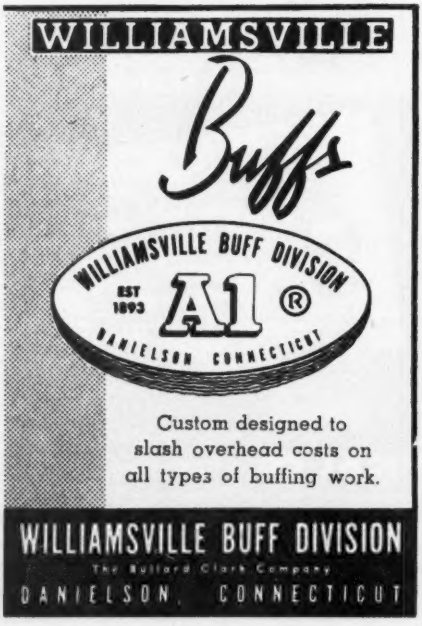
AMER-glas Air Filter

A replaceable type air filter, the AMER-glas, made in all standard sizes for forced air heating, ventilating, and air conditioning systems, has been introduced by the American Air Filter Co., Inc., Louisville, Kentucky.

The filtering media consist of continuous strands of glass filaments held together at each point of contact by a high-temperature plastic bond to form a resilient pad. The pad is sprayed with an odorless and non-flammable adhesive and placed in a fiberboard casing between metal grills.



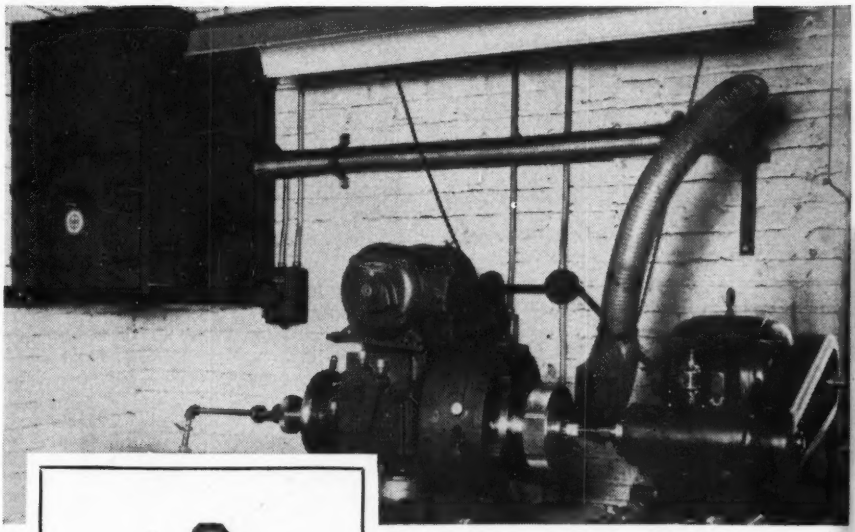
AMER-glas Air Filter

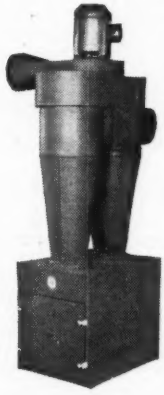


Single Tank Deionizer

One of the recent developments in the field of water conditioning is a single tank deionizer that brings the cost of high quality deionized water within the range of those who have heretofore found evaporated or distilled water prohibitive in cost. This equipment, a product of Elgin Softener Corp., Elgin, Ill., furnishes water of higher quality than that produced by two and four-column deionizers, the company states.

Using single-tank rather than multiple-tank equipment, the investment cost for this deionizer is considerably lower; higher quality water is produced more simply; water of uniform quality is delivered even in intermittent service; minimum space is required; less time is needed for regeneration of the ion-exchange material; and rinse requirements are reduced. An important feature of this equipment is its "double-check" manifold arrangement which guards against loss of zeolite during the backwashing operation and permits the use of deeper zeolite beds for increased capacity. Where valuable resinous zeolites are employed, as in the deionizer, prevention of zeolite loss by





Torit Dust Separators

Torit also manufactures a line of cyclone type dust separators, in sizes ranging up to 5 H. P. Many are designed for indoor recirculation of the filtered air. Above is a Twin Cyclone unit that delivers 2100 c.f.m., velocity 6,000 ft. per min., static pressure, 3".

I'll be hanged . . .

if you can't do a better job with

Torit Dust Collectors

Torit Dust Collectors are self-contained units for capturing and cleaning dust laden air from around grinding, polishing, and other dust creating machines. Compactly designed, they are easy to fit into present and future production layouts, for they will go most anywhere.

In the installation above, a Torit Dust Collector is hung from wall brackets. Others have been hung from ceilings, placed under the machine, or tucked in odd corners wherever a bit of space is available.

This compactness means efficiency. Torit Dust Collectors can be set close to machines, minimizing pipeline losses. They can be wired through the same starting switch to eliminate idle running and, as they recirculate the air after cleaning, no room heat is lost.

For details and latest Torit catalog, write:

TORIT

Manufacturing Co.

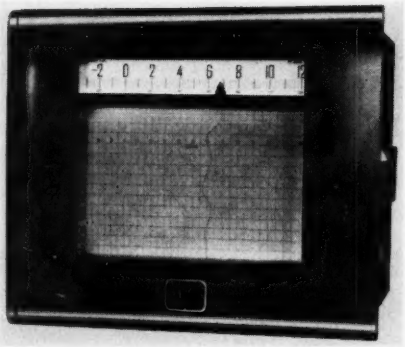
314 Walnut St. • St. Paul 2, Minn.

means of this type manifold is especially important.

Two types of resinous zeolite exchangers are used in the deionizer; one for the positively charged ions (cations) and one for the negatively charged ions (anions). The cation exchanger is regenerated by a dilute acid solution; the anion exchanger by a caustic solution. Instead of requiring separate exchanger tanks for each exchanger as in former deionizing equipment, the two exchangers are intermixed in a single tank. These exchangers have a marked difference in density which permits them to be divided by backwash into two zones for separate regeneration as illustrated. Each regenerant solution is introduced into its proper zone. Thus, in this simplified equipment, water is deionized, the zeolite mixture separated into its components, the two resins regenerated, remixed and again returned to the deionizing cycle. Simple manipulation of a multiport valve and supplementary controls accomplish (1) backwashing, (2) regeneration, (3) mixing the zeolites, (4) return to service.

Strip-Chart Electronic Instruments

The Bristol Co., 108 Bristol Rd., Waterbury 91, Conn., announces the development of a line of strip-chart electronic instruments, described as the Series 500 Strip-Chart Dynamaster Electronic Instruments. The Dynamaster is a high-speed, self-balancing a.c. bridge designed for measurement of temperature, resistance, conductivity, strain, position, inductance, pressure, force, or any other variable which can be measured in terms of impedance. In addition, it can be used for electric power totalization and as the receiver for Bristol's Metameter System of Telemetering.



Strip-Chart Electronic Instrument

The measured variable is recorded on a chart 11¼ inches wide and indicated on a large scale which is legible at a distance. In addition to the single record model, instruments are available for as many as 16 different records on the same chart. Models are offered for full-scale pen travel in 7, 3, and 2/3 seconds, with a full range of standard chart speeds from 1 inch per hour to 120 inches per minute.

Supplementing the recording instruments, Bristol also announces a complete line of Strip-Chart Dynamaster Automatic Controllers, including both electric-operated types and Free-Vane pneumatic types.

All Dynamaster strip-chart instruments are housed in a moisture, fume, and dust-proof case suitable for wall, flush-panel, or front-of-panel mounting. The scale and recording mechanism are mounted on the front of a hinged aluminum alloy panel, which is easily swung out to gain access to the electronic components or the controls.

Kocour Laboratory Rectifier

Kocour Co., 4800 S. St. Louis Ave., Chicago 32, Ill., is offering a high-quality laboratory type selenium rectifier. Specially designed to meet exacting requirements, the unit is said to be unusual for its smooth d.c. output, accuracy, and long life.

Unsurpassed for Hull Cell and Haring Cell tests, the rectifier is claimed to double as an efficient small scale plating source or battery charger. Specifications are as follows:

Input, 115 volts, 60 cycles; output,

Twenty-seven years' sanding experience can't be wrong!

BEHR-MANNING COATED ABRASIVES

RESINIZED DURITE® Paper

RESINIZED ADALOX® Paper

RESINALL GARNET Fibre

RESINIZED METALITE® Cloth

These 4 recently developed coated abrasives are resin-bonded to give you the highest production at the lowest cost per job. Constant research assures the consistent high quality you have a right to expect of BEHR-MANNING.

Ever since it was formed, this furniture company (name on request) has used BEHR-MANNING Coated Abrasives in its sanding. Occasional trial of competitive abrasives has merely demonstrated the company's good judgment in its initial selection, further confirmed by the many years of continuously excellent BEHR-MANNING service.

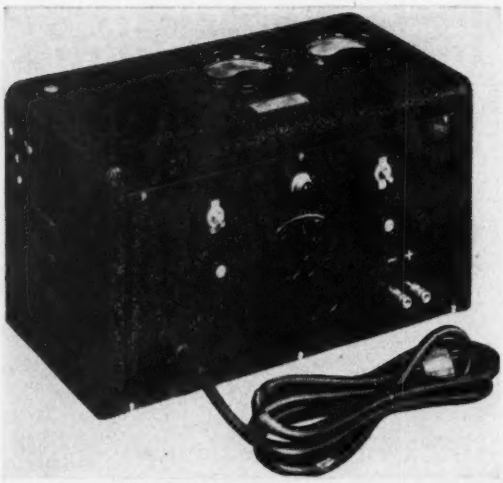
A check-up by our local Field Engineer may disclose surprising potential savings in your sanding costs, through fewer cover changes, longer belt life, less down-time, and faster production. Tell us when — address Dept. PF-2.

BEHR-MANNING®

BEHR-MANNING

TROY, N. Y.

Use NORTON® *abrasives* Sharpening Stones



Kocour Model 5A Laboratory Rectifier

0-6/12 volts d.c. at 5 amperes; continuous duty ratings; calibrated voltmeter and ammeter with 2.36-inch scales which are accurate within 2 per cent of full scale; primary and secondary fuse protection; smooth rheostat current control; long life full-wave selenium rectifiers; choke input filters with less than 5 per cent ripple over entire current range; jeweled pilot lights; 115-volt a.c. convenience outlet; 6-foot heavy-duty cord and plug; and rugged welded steel cabinet with baked-on black wrinkle finish. The rectifier is 14 x 8½ x 8 inches and weighs 2 pounds.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

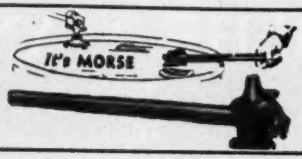
3M Adhesives, Coatings and Sealers. Properties of over 100 industrial adhesives, coatings and sealers, including strippable coatings for protecting metal finishes, are described in a catalog available from Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn. The 32-page booklet announces that more than 1,000 formulas are available, and offers research help for industrial customers in selecting the right product for the job. Also included are special sections of "Coro-Gard" protective coatings systems and specialized adhesives, coatings and sealers for the shipbuilding industry, the construction trades and the oil industry.

Enthone Metal Stripper N-165. Enthone, Inc., Dept. PF, 442 Elm St., New Haven, Conn., has issued data sheets thoroughly covering its metal stripper for dissolving nickel from copper alloys.

Parlon-Base Maintenance Paints. Reasons for using Parlon Paints to cut maintenance costs are set forth in a leaflet distributed by the Hercules Powder Co., Cellulose Products Dept., 927 Market St., Wilmington, Delaware.

Despatch CF Furnaces. The Despatch Oven Co., 619 S.E. 8th St., Minneapolis 14, Minn., has released its **Bulletin 84**, containing six pages in color describing and illustrating the many models of CF (cross flow) Furnaces available. Constructive details and specifications of these accurate and uniform, modern design units are also included.

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED.... **$3.00**
Non-sparking type $4.60
Plus Parcel Post
MORSE MFG. CO., Inc.
125 Dickerson, Syracuse 2, N.Y.

STOP OFF

FOR HARD CHROME

BUNATOL

No. 474 RED

The dependable low cost Stop Off for use in hard chrome plating, or in any acid solution. A heavy body liquid with deep red contrasting color. Lays over any surface without bridging. Air dries fast. Economical in material and labor cost. One coat usually sufficient. Trims easy to hair line edge which holds. Easy to remove after plating by soaking in hot alkali solution. No. 474 Red is the best Stop Off for production use. We also make Stop Offs for use in alkali plating solutions, anodizing and in parkerizing.

Don't forget we make rack insulation too, both in Air Dry and the baking Paste type.

A note on your letterhead will bring complete information and samples.

NELSON J. QUINN COMPANY TOLEDO 7, OHIO

— for 15 years —

Rack Insulation Exclusively

IT'S *Phillips* FOR
PRECISION CLEANING OF PRECISION PARTS AND INSTRUMENTS

ST-1 COMBINATION RECOVERY STILL DEGREASER

$245.00
F. O. B. CHICAGO

Reclaims Trichlorethylene and Perchlorethylene at the rate of 5 gallons per hour. Can also be used as a degreaser by immersing parts in boiling sump then into vapor area for the rinse and dry off.

Inside dimensions of each compartment: 14" x 15" with 11" working depth.

Write for full details and FREE Booklet— "Vapor Degreasing Questions and Answers"
DEPT. D

PHILLIPS MANUFACTURING COMPANY
3475 TOUHY AVENUE • CHICAGO 45, ILLINOIS

Hot-Lacquer Process. Hercules Powder Co., Cellulose Products Dept., 927 Market St., Wilmington, Del., has available two descriptive leaflets entitled **"The Case for the Hot-Lacquer Process"** and **"Questions and Answers About The Hot-Lacquer Process."**

Eastern Portable Mixers. Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn., has issued its **Catalog No. 500** which presents engineering suggestions and full operation and performance data on its portable mixers. Portable mixers powered by electric or air motors are illustrated and described, and applications for the various models are listed.

Electrical Products. A 12-page, two-color booklet listing the various models of Udylite rectifiers, regulators, switches, rheostats, and other electrical equipment for use in electroplating operations may be obtained from The Udylite Corp., 1653 E. Grand Blvd., Detroit 11, Michigan.

Water Bath and Mechanical Tube Holder for Gardner Bubble Viscometers are described and illustrated in a leaflet published by Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md. Prices are included.

Adams Modern Filtration Equipment. Methods and equipment for industrial water filtration are illustrated and compared in detail in a 20-page booklet prepared by R. P. Adams Co., Inc., Buffalo 17, N. Y. Pressure filtration systems are graphically diagrammed in three colors to show application for virtually every industrial use. The text discusses origins of filtration practice and the development of present filter media and backwashing techniques, including continuous automatic backwashing. **Bulletin No. 691** also contains cutaway views, operating data, and piping suggestions for single and battery installations.

Featured filtration equipment employs Adams Poro-Screen, Poro-Stone, or Poro-Carbon filter elements covering the entire range of porosity from 0.0001 to 0.004 inch.

Start Clean... *Stay* Clean!

It's frustrating to slick-up a dog then have him paw the garbage. It's *wasteful*—and expensive—to prepare work for plating then put it in a bath of questionable purity!

Start clean . . . *stay* clean! Red Label Darco S-51 adsorbs the impurities that cause trouble in plating baths . . . takes them out of the bath before they can be deposited on the freshly cleaned surface of your cleaned work.

Red Label Darco helps you save on scarce metals . . . helps you do a better job with thinner deposits and you get fewer rejects.

With clean metal... keep the Bath Clean

Red Label Darco S-51 is especially treated for use in plating . . . the only carbon that meets the benzol-mercury test! It is especially easy to handle . . . easy to wet . . . easy to make into a slurry. Place your order for Red Label Darco S-51 today. Practically all suppliers carry Darco in stock, so don't accept substitutes.

DARCO DEPARTMENT

ATLAS POWDER COMPANY

Darco General Sales Offices

60 East 42nd Street, New York 17, N. Y.

Stevens Polishing and Buffing Compositions. Frederic B. Stevens, Inc., Detroit 16, Mich., has issued **Catalog No. 50**, a twelve-page illustrated brochure containing illustrations and data on its many polishing and buffing compositions.

Photometric Unit and Exposure Heads for measurement of appearance and other optical properties of materials are the subject of a leaflet released by Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md. A table listing the exposure heads, the quantities they measure, and some applications is included.

"Selecting The Right Air Compressor" is the title of a four-page bulletin which lists the features of design and construction of the air compressors manufactured by the Kellogg Division of the American Brake Shoe Co., 93 Humboldt St., Rochester 9, N. Y. Tables are included to assist in selecting the proper size compressor.

Bristol Thermocouple and Pyrometer Accessories. The Bristol Co., Waterbury 20, Conn., has published a new edition of its thermocouple and pyrometer accessories bulletin, listing many additional items and containing new data on the proper application and use of thermocouples. The 56-page bulletin, **No. P1238**, contains a well-illustrated catalog of hundreds of pyrometer supply items, including assembled thermocouples, thermocouple wires, extension wires, protection tubes, insulators, and accessories for the full range of industrial pyrometer applications.

Latest technical information and installation sketches have been added to the "Users' Manual" section, which contains engineering data on modern practices in pyrometry. Also included are tables of calibration data for the commonly used base metal and rare metal thermocouples.

Metal Cleaning. Engineered modern cleaning machines are the subject of **Bulletin 54** offered by the American Machine and Solvents Co., 101 Park Ave., New York 17, N. Y. Methods of operation, specifications, and mechanical features of the Model 27-A/T Automatic Tumbler, Model 27-A/T-SP Small Parts Washer and Pickling Machine, Rotary Drum Machine, and Tabl-Spray Metal Washing Machine, together with illustrations, are given in the four-page catalog.

Wet Abrasive Finishing. A method of deburring and honing of all types of metals known as "HydroHone" is described and illustrated in a four-page bulletin available from the HydroHone Equipment Co., 222 W. Chambers St., Milwaukee 12, Wisconsin.

Make-Up Air Units to replace exhausted air and balance minus pressures, products of The New York Blower Co., 3166 S. Shields Ave., Chicago 16, Ill., are the subject of **Bulletin 502.** Characteristics, specifications, and features of the units are illustrated and described.

"13 Good Reasons Why Lacquer Is The Best Refinishing Material," a four-page leaflet, can be obtained by writing to the Hercules Powder Co., Cellulose Products Dept., 927 Market St., Wilmington, Delaware.

Columbia Tong Test Ammeters for instant current measurements are the subpect of a six-page bulletin issued by the Columbia Electric Mfg. Co., 4535 Hamilton Ave., N. E., Cleveland 14, Ohio. Features, construction, and uses, together with illustrations of the various styles available, are included in the bulletin. In addition, photos of actual shop applications are presented.

For a real good polishing job use

Keystone TURKISH Emery

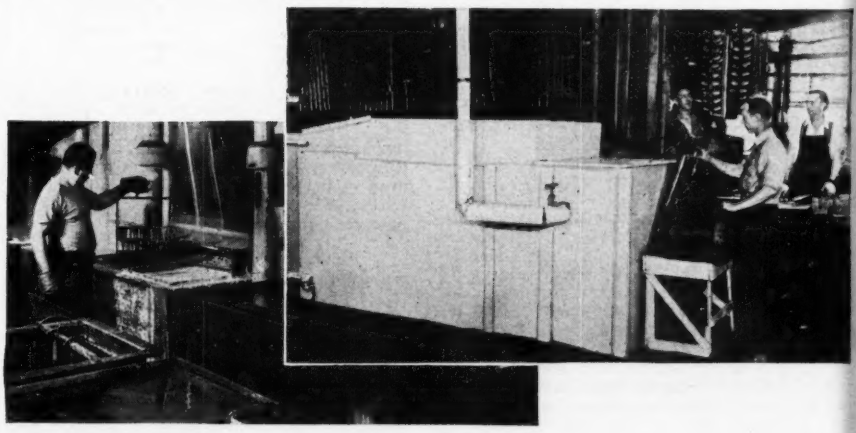
FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Whether Your Finishing Production Be Large or Small

BLACK MAGIC FINISHING PROCESSES

Will Adequately Fill Your Requirements



Black Magic blackening processes, the proven black oxide finishes for firearms, magazines, grommets, etc., are again being used for military requirements, meeting Army, Navy and Air Force Specifications for this type of black oxide finish. Black Magic is readily adapted to fully automatic or hand-operated operations.

Send for the catalog containing complete details. Our field engineers are available to assist you with your problems.

MITCHELL-BRADFORD CHEMICAL COMPANY

MODERN METAL FINISHES

2446D MAIN ST., STRATFORD, CONN.

BLACK-MAGIC OXIDE BLACKING SALTS
WITCH-DIP & WITCH-OIL FINAL FINISHES

SILCO *Glass-Base* PROTECTIVE COATING
HEAT TREATING SALTS, CLEANERS, ETC.

Electric Process Heating. A folder describing in detail a type of industrial oven construction composed of electric heater panels and standardized frame members is available from the Advance Heating Division of Jensen Specialties, Inc., 9331 Freeland Ave., Detroit 28, Michigan.

Solvent Emulsion Cleaners. A folder which describes a series of emulsion cleaners which have been designed to remove both oil-soluble and water-soluble soils from any metal or alloy, without attacking the base metal, and without damaging most paint finishes, has been issued by the Detrex Corp., Box 501, Detroit 32, Michigan.

Belke Filters. Complete information on improved Belke Filters which have a new slurry tank design as well as recently developed Belke Lucite filter plates is presented in **Bulletin 1247** furnished by the Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill. Data on Type-A filters for acid solutions and Type-C filters for cyanide solutions are included. Both horizontal plate and vertical plate models are described.

Chemical Resisting Protective Coatings. A bulletin describing five groups of chemical resisting Ucilon Protective Coatings has been made available by United Chromium Incorporated, 100 E. 42nd St., New York 17, N. Y. Described are coatings based on vinyl resins, phenolic resins, fish oils, chlorinated rubber, and also water emulsion coatings. The coatings are resistant to acids, alkalies, petroleum and its derivatives, water, oxidants, salt solutions, alcohols, and many solvents.

Electrofilm Graphite Processes, which produce a solid film or "dry" lubricant impregnated into the surfaces of metals, ceramics, and so on, to reduce friction and wear, are completely covered in a group of data sheets available from the Pyrene Manufacturing Co., Metal Finishing Div., 10 Empire St., Newark 5, New Jersey.

Grav-i-Flo Process. Complete data on the Grav-i-Flo Process and equipment for grinding, deburring, and finishing metal parts, together with illustrations and prices of the various models, are included in a catalog available from the Grav-i-Flo Corp., 400 Norwood Ave., Sturgis, Michigan.

"Production Time & Cost Savers" is the title of an eight-page bulletin, **No. B8,** available from the Triangle Equipment Co., Inc., 45 River Rd., Nutley, N. J. Featuring overhead and gravity conveyors, load toters and boosters, and freight ladders, products of the Tipp Manufacturing Company, the bulletin is well illustrated and contains pertinent information on conveyor construction and application.

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

GOLD PLATING SOLUTIONS
In All Colors
Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant
Proven Quality by the Acid Test
Write or call our experts about your plating problems
Davis-K-Products Co.
54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

Opportunity Section

SALES ENGINEERS

Excellent and established territories open in S. E. United States. Maryland and South to Gulf, and East of Mississippi. Salesmen must be qualified to represent well rated manufacturer of metal cleaning machinery. Valuable increasing solvent sales guarantee steady monthly income. Address Box No. 22, c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

HELP WANTED

Salesman for lacquers and enamels by national manufacturer for the State of Michigan and Los Angeles territory. Box No. 23, c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

NEW JERSEY REPRESENTATIVE

ERONEL SERVICES, INC.,
New Milford, Conn.,
HOUGHTON LABORATORIES, INC.,
Olean, New York

JAMES L. FITZSIMMONS
Direct Factory Representative
37 Lackawanna Plaza Bloomfield, N. J.

SITUATION OPEN

PLATING ENGINEER WHO KNOWS HOW TO ARRANGE TANKS AND MACHINERY TO PRODUCE VARIOUS QUANTITIES OF WORK. STATE EXPERIENCE, WHERE EMPLOYED AND SALARY DESIRED. PERMANENT POSITION. Box No. 21, c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

Superfinishing and Polishing Machines. Descriptive literature giving full particulars and specifications of the Four-Eighty-Four Centerless Superfinishing and Polishing Machines can be obtained from the Production Machine Co., Greenfield, Massachusetts.

G-E Pyrometer Equipment, which offers accurate temperature indication, close temperature control of industrial processes, and protection for furnaces, ovens, and kilns, has been described and illustrated in an eight-page two-color booklet, **No. GEA-5534,** by the General Electric Co., Schenectady 5, New York.

Goodrich Industrial Aprons. A four-page catalog section on its lines of industrial aprons has been published by The B. F. Goodrich Co., Akron, Ohio. Featured are aprons made of Koroseal, the company's flexible material. Also described in the catalog section are various aprons made of different types of rubber for their particular usages. Recommendations for the particular service, together with specifications of the product, are included.

Minerals, Colors, and Pigments, supplied by Wittaker, Clark & Daniels, Inc., 260 W. Broadway, New York 13, N. Y., are listed and classified according to suggested uses in a complete catalog issued by the company. Among the products listed are abrasives, clays, and talcs of various kinds. Each product is classified according to physical characteristics and chemical composition.

Cellulose Esters. Prepared by Tennessee Eastman Corporation of Kingsport, Tennessee, is a completely new and considerably expanded edition of **Eastman Cellulose Esters.** This 59-page book includes comprehensive and detailed information covering uses and specifications of Eastman cellulose esters, the compatability of these esters with solvents, resins and plasticizers, and procedures of analysis. It is primarily a laboratory manual for those interested in using cellulose esters in applications such as textile coatings and impregnations, paper coatings and impregnations, lacquers, molding compositions, paint and lacquer removers, photographic film sheeting, laminated foil, tape and thread, protective strippable coatings, and synthetic fibers.

The Finishing Touch — *By J. A. Patterson*

"Heavens, will it take that long just to plate those little buttons?"

INDEX TO ADVERTISEMENTS

Abbott Ball Co. 91
Acme Mfg. Co. 87
Allied Research Products, Inc. 81
Almco Div., Queen Stove Works, Inc. 44
Alrose Chemical Co. 41
Alvey-Ferguson Co. 45
American Brake Shoe Co., Kellogg Div. 20, 21
American Chemical Paint Co. 63
Automotive Rubber Co. 79

Bacon Felt Co. 112
Baker & Co., Inc. 8
Baughn Chemical Products Co. 82
Behr-Manning, Div. of Norton Co. 117
Better Finishes & Coatings, Inc. 62
Blakeslee & Co., G. S. 6

Cambridge Wire Cloth Co. 109
Carborundum Co. 7
Columbia Electric Mfg. Co. 40
Cowles Chemical Co. 12

Darco Dept., Atlas Powder Co. 121
Davis-K-Products Co. 124
Detrex Corp. ..... Fourth Cover
Detro Mfg. & Sales Co., Inc. 66
DeVilbiss Co. 36, 37
Du-Lite Chemical Corp. 95

Egyptian Lacquer Mfg. Co. 4
Enthone, Inc. 27
Exolon Co. 75

Fostoria Pressed Steel Corp. 46, 47

Hammond Mchry. Builders, Inc. 105
Hanson-Van Winkle-Munning Co. 3
Harrison & Co., Inc. 96
Harshaw Chemical Co. 113
Hercules Powder Co. 73
Holland & Sons, Inc., J. 84

Industrial Filter & Pump Mfg. Co. 54
Interchemical Corp., Finishes Div. ..... Third Cover
International Nickel Co., Inc. 10, 11

Jensen Specialties, Inc. 69

Kalamazoo Tank & Silo Co. 90
Kay & Ess Co. 55
Kellogg Div., American Brake Shoe Co. 20, 21
Keystone Emery Mills 122
Klem Chemicals, Inc. 43
Koch Sons, Inc., George 97
Kold-Hold Mfg. Co. 83

Lanly Co. 56
Lasalco, Inc. 25
Lowe Bros. Co. 28, 29

MacDermid, Inc. 49
Mahon Co., R. C. 64, 65
Mitchell-Bradford Chemical Co. 123
Morse Mfg. Co., Inc. 118
Murray-Way Corp. 111

National Air Sander, Inc. 59
National Paint, Varnish & Lacquer Assoc., Inc. 34, 35
Neilson Chemical Co. 9
Norton Co. 2
Nu-Matic Grinders, Inc. 93

Oakite Products, Inc. 1
Osborn Mfg. Co. 53

Parker Rust Proof Co. 50, 51
Pelron Corp. 68
Pittsburgh Plate Glass Co., Brush Div. 61
Platers Research Corp. 116

Quinn Co., Nelson J. 119

Randolph Products Co. 92
Robinson & Son, A. 39
Rockford Varnish Co. 85

Schaffner Mfg. Co. 120
Schmieg Industries ..... Second Cover
Sherwin-Williams Co. 70, 71
Siefen Co., J. J. 57
Stevens, Inc., Frederic B., Div. of Udylite Corp. 67
Striplastic Co. 72
Sulphur Products Co. 26

Torit Mfg. Co. 115
Triangle Equipment Co., Inc. 32
Turco Products 110

Udylite Corp. 33
U. S. Rubber Co. 42

Varnish Products Co. 74

Wiegand Co., Edwin L. 81
Williamsville Buff Div., Bullard Clark Co. 114

Young & Bertke Co. 89

A New Service to Readers

From now on, each issue of PRODUCTS FINISHING will contain two Reader Service Cards — located just inside the second and third covers. These cards may be used by the reader to obtain additional information on equipment, materials, or processes described on the editorial or advertising pages of the magazine.

To secure the information desired, please fill in these cards *completely* with:

1. The name of the company on whose product you want further information.
2. The page number.
3. Your company's name, street address, city, state, and your name and title.

Then mail the card to us. We pay the postage. We will forward your inquiries to the companies concerned.

Readers should feel free to forward requests for product or process information, catalogs, or technical data that will be helpful to them in keeping up to date on developments in the finishing field.

PRODUCTS FINISHING is pleased to assist readers in this way.

Ezra A. Blount

Editor

PRODUCTS FINISHING—Your authoritative source of information on finishes for metal products.

TO GIVE YOUR PRODUCT A GOOD START, GIVE IT AN INTERCHEMICAL FINISH!

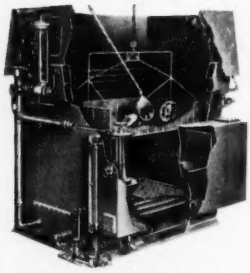
Undercoats . . . Varnishes . . . Lacquers . . .
Enamels for Metal . . . Plastic . . . Wood

AULT & WIBORG, MURPHY, ROXALIN, AND IC ARE TRADEMARKS OF INTERCHEMICAL CORPORATION

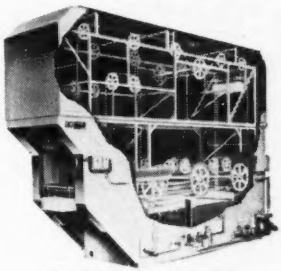
You'll SAVE on Metal-Cleaning Job with Machines and Cleaning Agents

DETREX builds all sizes of hand-operated and conveyorized degreasers and washers for parts of every shape and size from needles to auto bodies—castings, forgings, tubing, wire and stampings—ferrous, non-ferrous and mixed loads—in any volume desired.

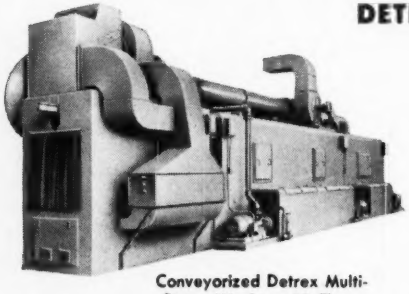
For most jobs, *standard* Detrex machines provide top speed and economy, either used "as is" or with minor modifications. For the really unusual jobs, special machines are designed and built to assure the same top efficiency.



Detrex Hand-Operated Vapor-Slush Degreaser



Three-Dip Detrex Degreaser with Cross-Rod Conveyor



Conveyorized Detrex Multi-Stage Washer with Three Spray Zones and Blowoff

DETREX SPECIALIZED CLEANING AGENTS Include:

DEGREASING SOLVENTS for

★ ***Both ferrous and non-ferrous metals, and adverse operating conditions***—PERM-A-CLOR, the most highly stabilized of all trichlorethylene solvents.

★ ***Average applications***—TRIAD, identical to Perm-A-Clor in cleaning power.

ALKALI and EMULSION CLEANERS for

★ ***Aluminum*** parts and ***painted surfaces.***

★ ***Brass, aluminum*** and ***white metal*** parts.

★ ***Heavy-duty*** cleaning of ***iron, steel*** and their alloys.

★ Cleaning and neutralizing prior to ***vitreous enameling.***

★ ***Electrolytic cleaning*** especially for plating.

★ ***Heavy-duty stripping*** of pigmented oil paints, synthetics, and baked enamels.

★ ***Removing all kinds of oils and insoluble dirt,*** without attack on surface or coating.

Detrex machines and cleaning agents, *fitted to the job,* assure fast and thorough cleaning at lowest cost. That's why it pays to see your Detrex man on *every* metal-cleaning application

DETREX

DETROIT MICH.

DETREX Corporation

BOX 501, DETROIT 32, MICHIGAN